

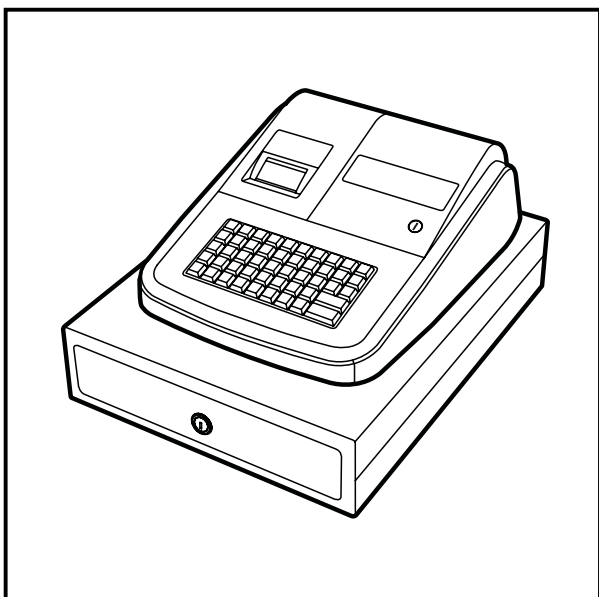
SAM4S

ELECTRONIC CASH REGISTER

ER-180 SERIES

SERVICE Manual

ELECTRONIC CASH REGISTER



C O N T E N T S

1. Precaution Statements
2. Product Specifications
3. Installation and Operation
4. Assembly and Disassembly
5. Exploded View and Parts List
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About this Manual

This service manual describes how to perform hardware service maintenance for the SAM4S ER-180 Series Electronic Cash Register.

Notes

Notes may appear anywhere in the manual. They describe additional information about the item.

Precaution symbols

. Indicates a Safety Precaution that applies to this part component.

. Indicates the part or component is an electro-statically sensitive device. Use caution when handling these parts.

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SAM4S ER-180 SERIES

Service Manual First edition.

March 2010.

V1.0

Printed in KOREA

Overview of this ECR

This ECR is a microcontroller-based system, using an 8 bits microcontroller.

This service manual provides the technical information for many individual component systems, circuits and gives an analysis of the operations performed by the circuits. If you need more technical information, please contact our service branch or R&D center. Schematics and specifications provide the needed information for the accurate troubleshooting.

All information in this manual is subject to change without prior notice. Therefore, you must check the correspondence of your manual with your machine. No part of this manual may be copied or reproduced in any form or by any means, without the prior written consent of Shin Heung Precision.

Note: Before using this Electronic Cash Register (ECR) for the first time, Insert the battery(AA-type*3pcs) into the battery case. And fulfill "MEMORY ALL CLEAR" procedure.

"Proper disposed of batteries is required. Refer to your local codes for disposed requirements."

1 Precaution Statements

Follow these safety, servicing and ESD precautions to prevent damage and to protect against potential hazards such as electrical shock.

1-1 Safety Precautions

1. Be sure that all built-in protective devices are replaced. Restore any missing protective shields.
2. When reinstalling the chassis and its assemblies, be sure to restore all protective devices, including nonmetallic control knobs and compartment covers.
3. Make sure there are no cabinet openings through which people - particularly children - might insert fingers and contact dangerous voltages.
Such openings include excessively wide cabinet ventilation slots and improperly fitted covers and drawers.
4. Design Alteration Warning:
Never alter or add to the mechanical or electrical design of the ECR. Unauthorized alterations might create a safety hazard. Also, any design changes or additions will void the manufacturer's warranty.
5. Components, parts and wiring that appear to have overheated or that are otherwise damaged should be replaced with parts that meet the original specifications. Always determine the cause of damage or over- heating, and correct any potential hazards.
6. Observe the original lead dress, especially near the following areas: sharp edges, and especially the AC and high voltage supplies.
Always inspect for pinched, out-of-place, or frayed wiring. Do not change the spacing between components and the printed circuit board. Check the AC/DC Adaptor for damage. Make sure that leads and components do not touch thermally hot parts.
7. Product Safety Notice:
Some electrical and mechanical parts have special safety-related characteristics which might not be obvious from visual inspection. These safety features and the protection they give might be lost if the replacement component differs from the original - even if the replacement is rated for higher voltage, wattage, etc.
Components that are critical for safety are indicated in the circuit diagram by shading, () or (). Use replacement components that have the same ratings, especially for flame resistance and dielectric strength specifications. A replacement part that does not have the same safety characteristics as the original might create shock, fire or other hazards.

CAUTION

Danger of explosion if battery is incorrectly replaced.

Replace only with the same or equivalent type recommended by the manufacturer.

Dispose used batteries according to the manufacturer's instructions.

ATTENTION

Il y a danger d'explosion s'il y a remplacement incorrect de la batterie.

Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur.

Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

1-2 Servicing Precautions

WARNING: First read the-Safety Precautions-section of this manual. If some unforeseen circumstance creates a conflict between the servicing and safety precautions, always follow the safety precautions.

WARNING: An electrolytic capacitor installed with the wrong polarity might explode.

1. Servicing precautions are printed on the cabinet. Follow them.
2. Always unplug the units AC/DC Adaptor from the AC power source before attempting to:
 - (a) Remove or reinstall any component or assembly
 - (b) Disconnect an electrical plug or connector
 - (c) Connect a test component in parallel with an electrolytic capacitor
3. Some components are raised above the printed circuit board for safety. An insulation tube or tape is sometimes used. The internal wiring is sometimes clamped to prevent contact with thermally hot components. Reinstall all such elements to their original position.
4. After servicing, always check that the screws, components and wiring have been correctly reinstalled. Make sure that the portion around the serviced part has not been damaged.
5. Always connect an instrument's ground lead to the instrument chassis ground before connecting the positive lead ; Always remove the instrument's ground lead last.

1-3 Precautions for Electrostatic Sensitive Devices (ESDs)

1. Some semiconductor (solid state) devices are easily damaged by static electricity. Such components are called Electrostatic Sensitive Devices (ESDs); examples include integrated circuits and some field-effect transistors. The following techniques will reduce the occurrence of component damage caused by static electricity.
2. Immediately before handling any semiconductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground. Alternatively, wear a discharging wrist-strap device. (Be sure to remove it prior to applying power - this is an electric shock precaution.)
3. After removing an ESD-equipped assembly, place it on a conductive surface such as aluminum foil to prevent accumulation of electrostatic charge.
4. Do not use freon-propelled chemicals. These can generate electrical charges that damage ESDs.
5. Use only a grounded-tip soldering iron when soldering or unsoldering ESDs.
6. Use only an anti-static solder removal device. Many solder removal devices are not rated as anti-static; these can accumulate sufficient electrical charge to damage ESDs.
7. Do not remove a replacement ESD from its protective package until you are ready to install it. Most replacement ESDs are packaged with leads that are electrically shorted together by conductive foam, aluminum foil or other conductive materials.
8. Immediately before removing the protective material from the leads of a replacement ESD, touch the protective material to the chassis or circuit assembly into which the device will be installed.
9. Minimize body motions when handling unpackaged replacement ESDs. Motions such as brushing clothes together or lifting a foot from a carpeted floor can generate enough static electricity to damage an ESD.

2 Product Specifications

Specifications are correct at the time of printing. Product specifications are subject to change without notice. See below for product specifications.

2-1 General Specification

A. System Specifications

Item	Description	Remark
Processor	• RENESAS CPU R5F21248 (8-Bit)	
Memory	• DATA SRAM : 3KBytes (CPU internal) • PGM FLASH : 64KBytes (CPU internal)	
Battery	• Type : AA-type • Spec : 1.5V * 3pcs	Non-Rechargeable
Data Storage	• Approx. 1 Year	
Printer	• Model : M-42V (EPSON) • Print Speed : 2.2 LPS • Type : Wheel selecting type	Detail Spec refers to next page
Display	• Operator Display : 8 Digits LED • Customer Display : 8 Digits LED #Option	
Keyboard	• Max. 48 Keys Raised-I (w/o cap) • Max. 48 Keys Raised-II (with cap) #Option	
Drawer	• B-type (3B4C, 4B4C) • Bplus-type (3B4C, 4B4C) #Option • G-type (5B5C, 4B8C, 5B8C) #Option • Compulsory s/w #Option	
Consumption	• Max. : 8W Reg. :5W	
Power Requirement	• Adaptor DC7V/2A (Input : AC 90~260V / 50~60Hz)	
Environment Condition	• Temperature : 0℃ ~ 45℃ • humidity : 30% ~ 80% RH	
Dimensions(mm)	• 420(L) X 325(W) X 202(H) • 450(L) X 400(W) X 218(H)	With B-Drawer & Bplus Drawer With G-Drawer (Option)
Weight	• 3.8Kg (SET only) • 8.1Kg (SET only)	With B-Drawer & Bplus Drawer With G-Drawer (Option)

Table2-1 General Specifications

2. Product Specifications

B. Printer Specifications

Item		Description	Remark
Printing System		• Print wheel selecting type serial printer	
Print Column Capacity		• 19 column max.	
Character Position		• Symbols column 13 positions + 1 empty position • Numeral column 14 positions	
Character Size		• 1.6mm (W) x 2.2mm (H)	
Character Space	Column Space	• 2.1mm between numerals • 2.6mm between numeral and symbol • 2.3mm between symbols	
	Line Space	• 4.6mm	
Printing Speed	19 Columns	• Approx. 0.9 Line/sec	Average speed At 6.0 Vdc
	7 Columns	• Approx. 2.2 Line/sec	
Printing Paper Roll	Type Paper	• Ordinary type	
	Paper Width	• 57.5 ± 0.5 mm	
	Outside Diameter	• $\Phi 80$ mm or less	
	Paper Thickness	• 0.06 ~ 0.85mm	
	Basic Weight	• 47 ~ 64 g/m ² (40 ~ 55 kg/1000 sheets/1091 x 788mm)	
Paper Feeding		• Quick feed • Approx. 8 Line/sec, Paper release mechanism	
Ink Roll	Color	• Black	
	Life	• Refer to the separate "Specifications of Model 42V"	
	Standard	• IR-40	
Motor	Terminal Voltage	• 6.0 (+0.5 / -2.0) Vdc	At 6.0V, 25℃ 19 columns 7 character shift print
	Mean Current	• Approx, 0.25A	
Detector		• Mechanical contact • Reset pulse signal R • Timing pulse signal T • Timing auxiliary pulse signal T	
Trigger Coil (magnet)	Terminal Voltage Direct	• 6.0 (+0.5 / -2.0) Vdc	
	Current Resistance	• Approx. 20Ω (25℃)	
Connection Printer Side		• Jumper Wire	
Guaranteed Operating Temperature		• 0℃ ~ 50℃	
Reliability (MCBF)		• 70,000 columns	
Overall Dimension		• 86mm (W) x 50mm(D) x 19mm (H)	
Weight		• Approx. 90g	

Table2-2 Printer Specification

2-2 Appearance

A. Appearance Dimensions (mm)

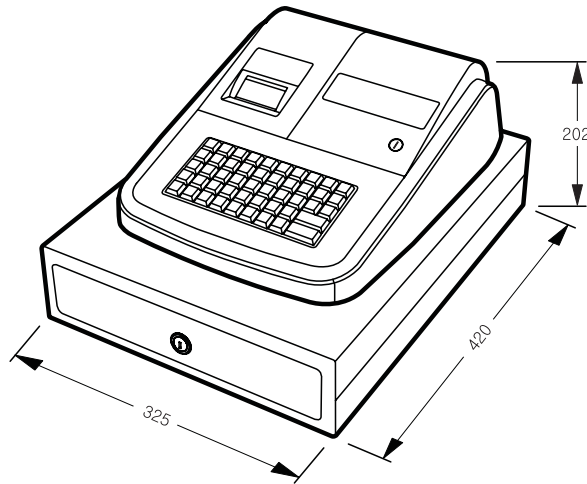
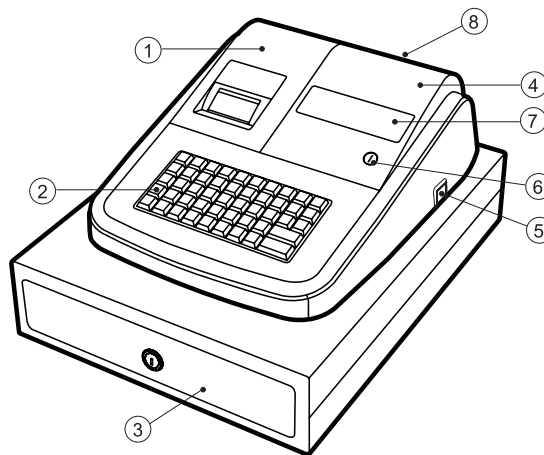


Figure2-1 Dimensions

B. ECR Features



- ① Cover Printer
- ② Key Board
- ③ Cash Drawer
- ④ Cover Display
- ⑤ Power Jack
- ⑥ Mode Switch
- ⑦ Front Display
- ⑧ Rear Display(Optional)

Figure2-2 Location Feature

Memo

3 Installation and Operation

WARNING: Before using Electronic Cash Register (ECR) for the first time, Insert the battery (AA-type*3pcs) into battery case.

And fulfill “MEMORY ALL CLEAR” procedure.

3-1 Installation

3-1-1. Paper Roll Installation and Take-Up Spool Installation

1. Remove the printer cover.(Fig 3-1 (A),(B))
2. Lift the cover and Insert the paper roll as shown.(Fig 3-1 (C), (D), (E))
3. Lay a cover on the side and press the FEED button.(Fig 3-1 (F))
4. Feed the leading edge of the paper in about 150mm and fold the tip in 20mm.
Insert the leading edge of the paper into the slot on the Spool Winding. (Fig 3-1 (G),(H))
5. Turn the Spool Winding in 2~3 turns. (Fig 3-1 (I))
6. Place the Spool Winding on the Paper Supply. If it loosen, turn to tighten it. (Fig 3-1 (J))
7. Replace the printer cover.(Fig 3-1 (K))

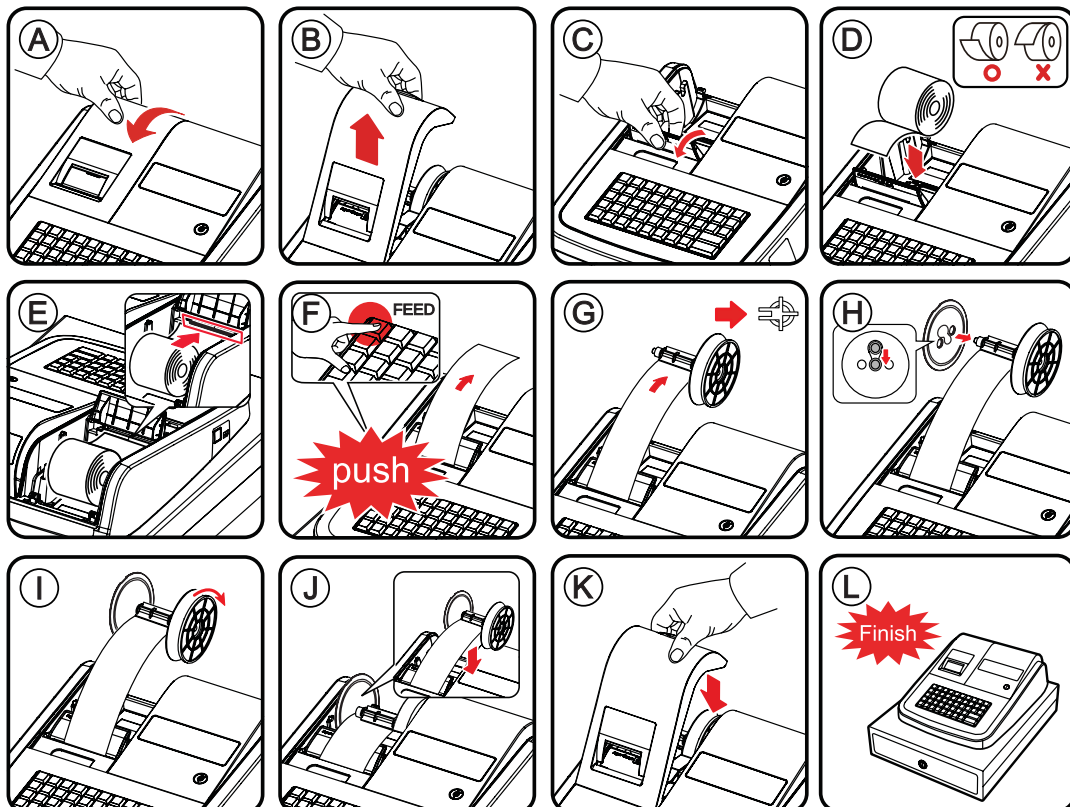
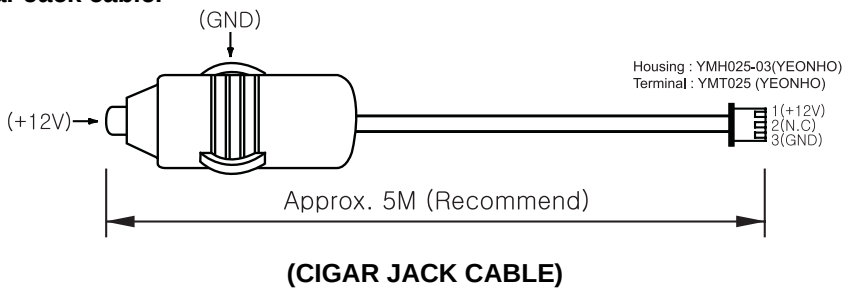
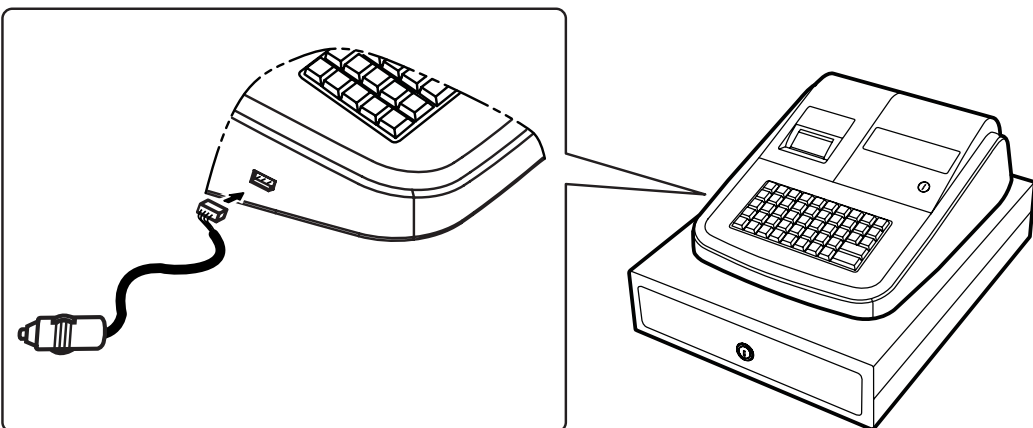


Figure 3-1. Paper Installation and Take-Up Spool Installation

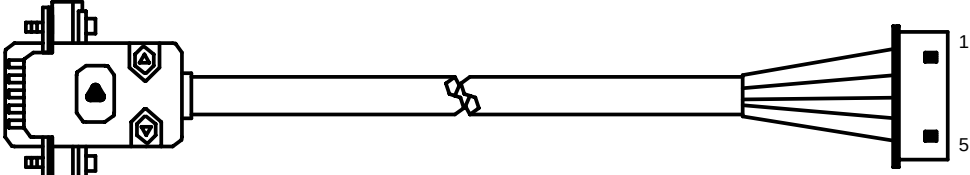
3. Installation and Operation

3-1-2. Cigar-Jack Power Installation

Warning: Only use Cigar-Jack Power. Do not connect AC Power Cord.

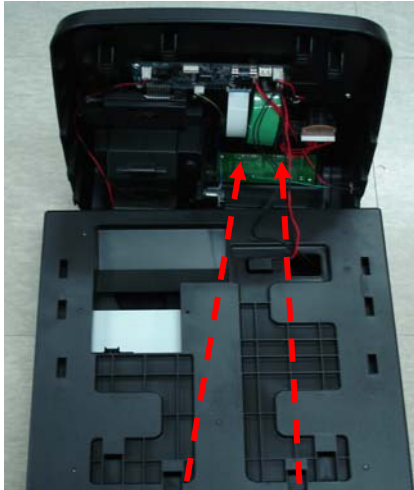
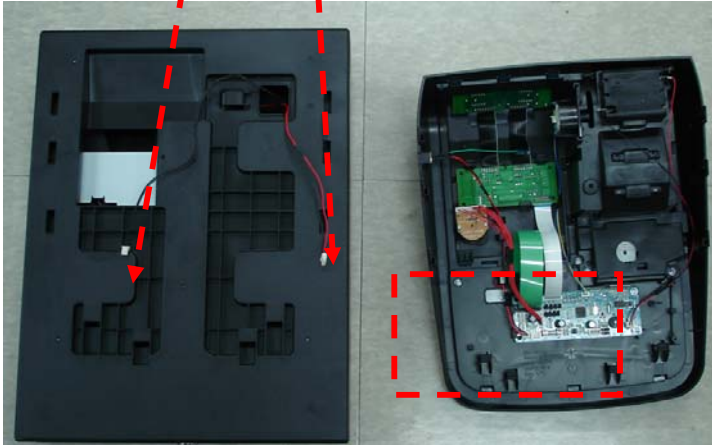
No	Description
1	1. Use the Cigar Jack cable.  (CIGAR JACK CABLE)
2	1. Insert the CIGAR JACK CABLE like below figure. 2. Connect the 3 Pin connector of the CIGAR JACK CABLE for a Vehicle Battery. 

3-1-3. Program Download

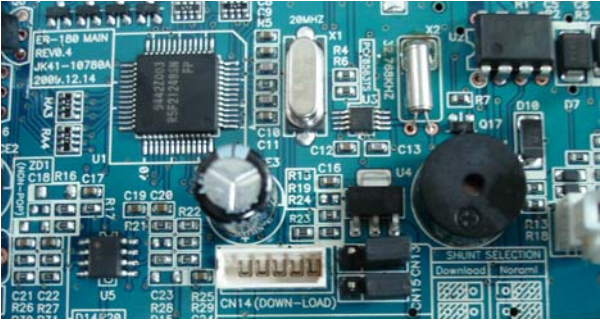
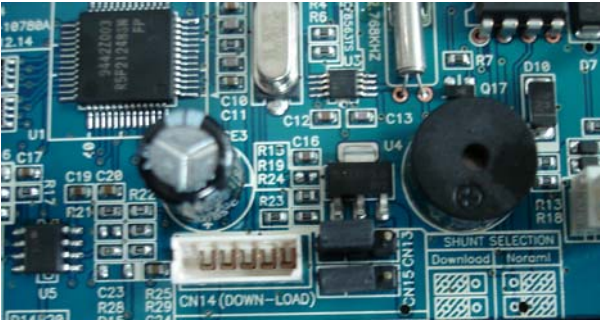
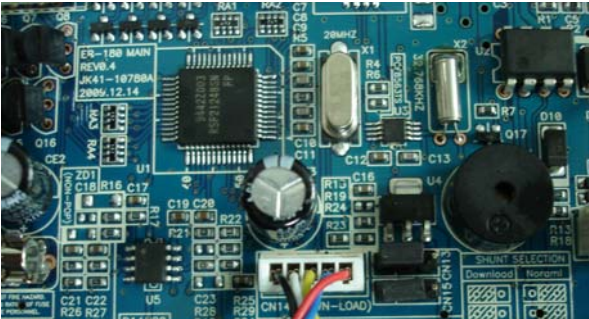
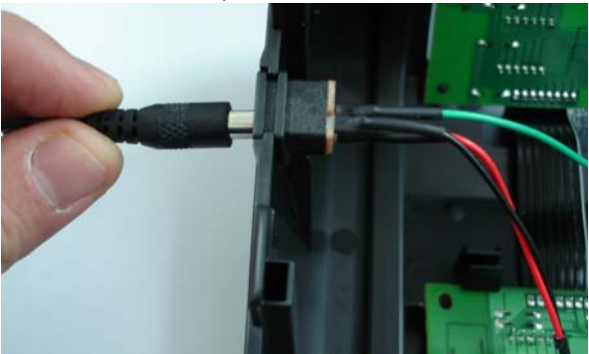
No	Description
1	DOWNLOAD CABLE for Program Update. (Special Cable for ER-180/180T)  (DOWNLOAD CABLE)
2	– Disassemble the cover printer 
3	– Disassemble the screw. 

3. Installation and Operation

3-1-3. Program Download

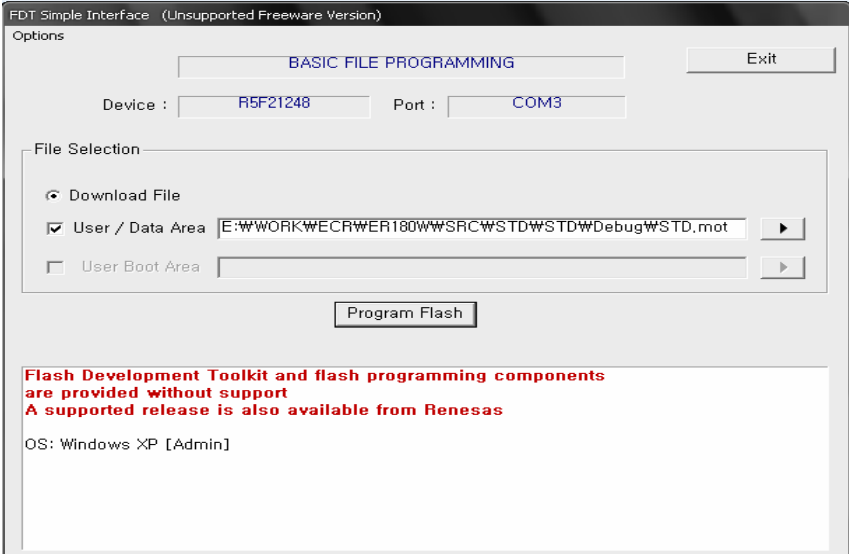
No	Description
4	– Disassemble the drawer. 
	– Disconnect the drawer harness and compulsory harness. Disassemble the drawer. 

3-1-3. Program Download

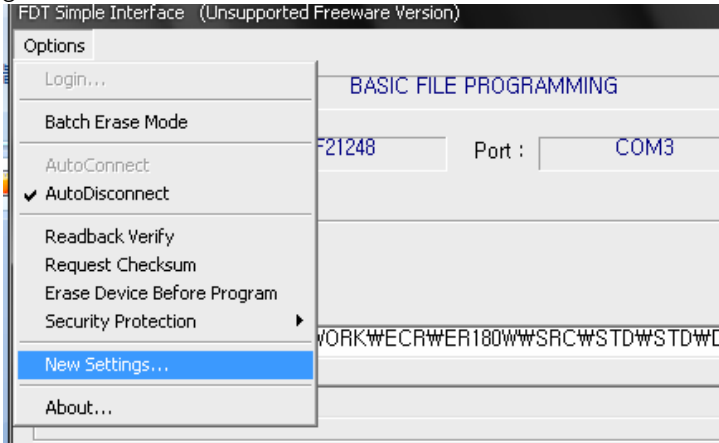
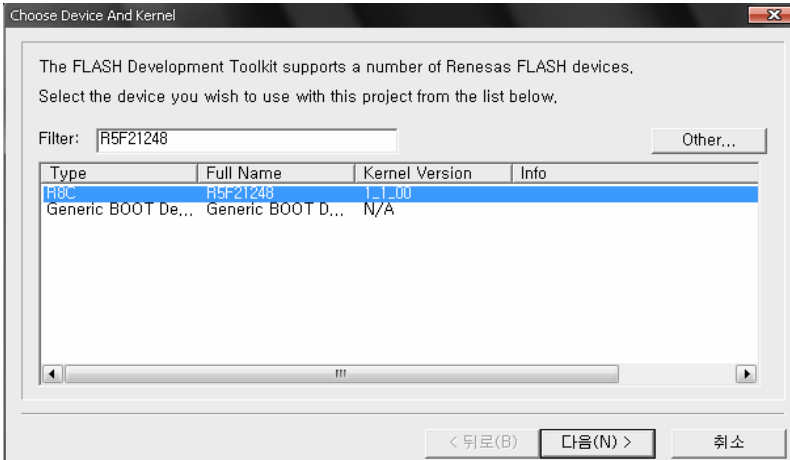
No	Description
5	See the SHUNT SELECTION on the main board.
	 Move the black download dip switch cap to left position(download mode).
	
	Insert the download cable. 
	Insert the DC power cord. 

3. Installation and Operation

3-1-3. Program Download

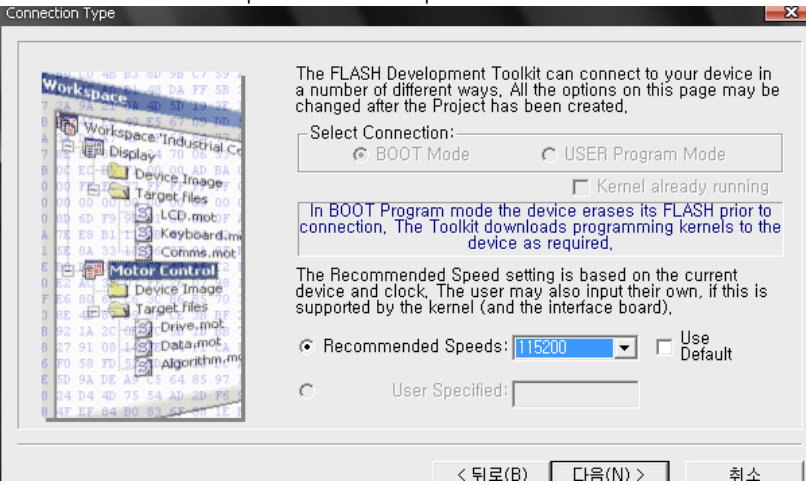
No	Description
6	– Install and Run the Flash Development Tool Kit program. During installation, choose all setting options as default value. – Run the Flash Development Tool Kit in the Renesas program folder. 

3-1-3. Program Download

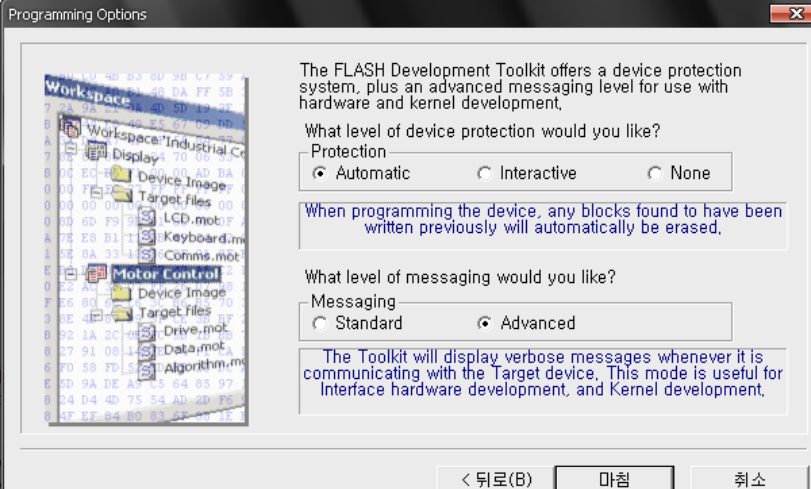
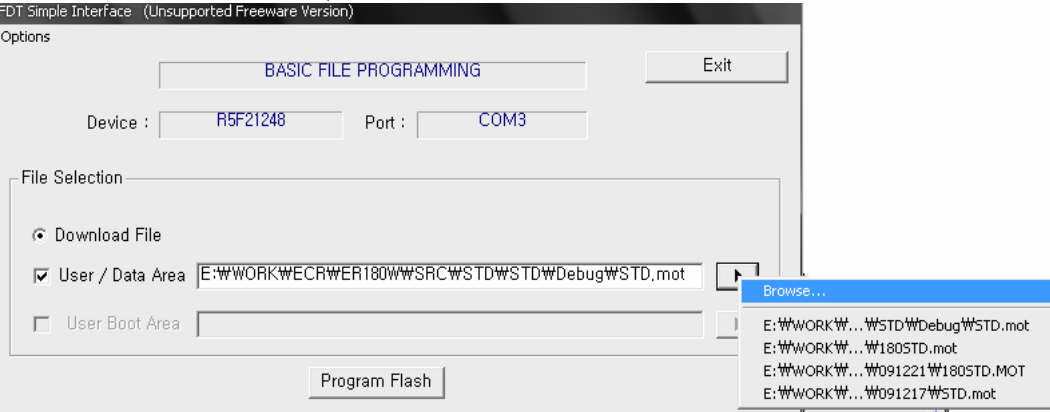
No	Description
7	– Click the Options menu and check the “ AutoDisconnect” and then click the “ New Settings menu”  – Type “ R5F21248” in the Filter Edit box and select R8C R5F21248 and press “ Next” button. 

3. Installation and Operation

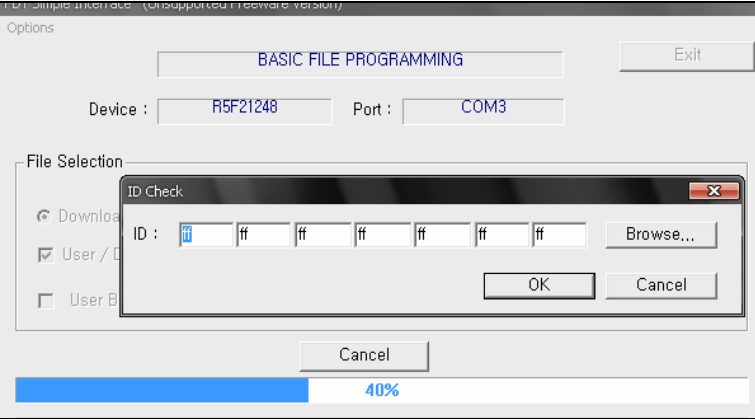
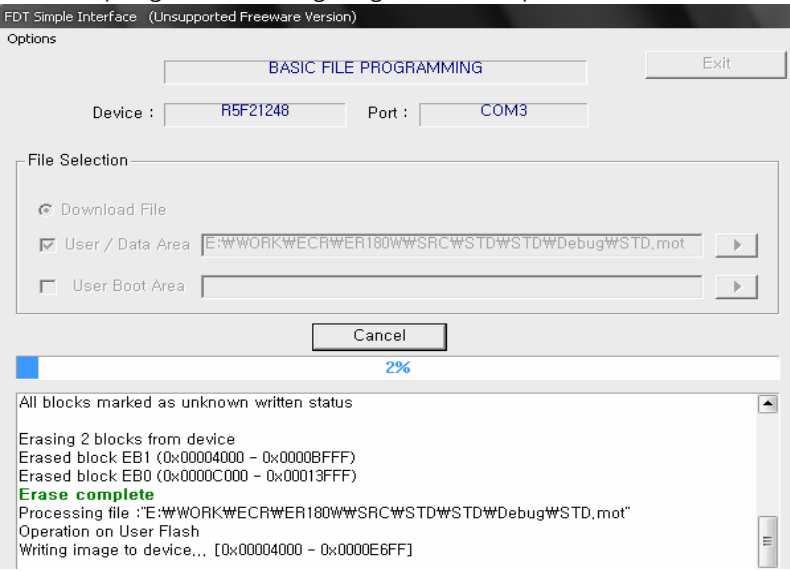
3-1-3. Program Download

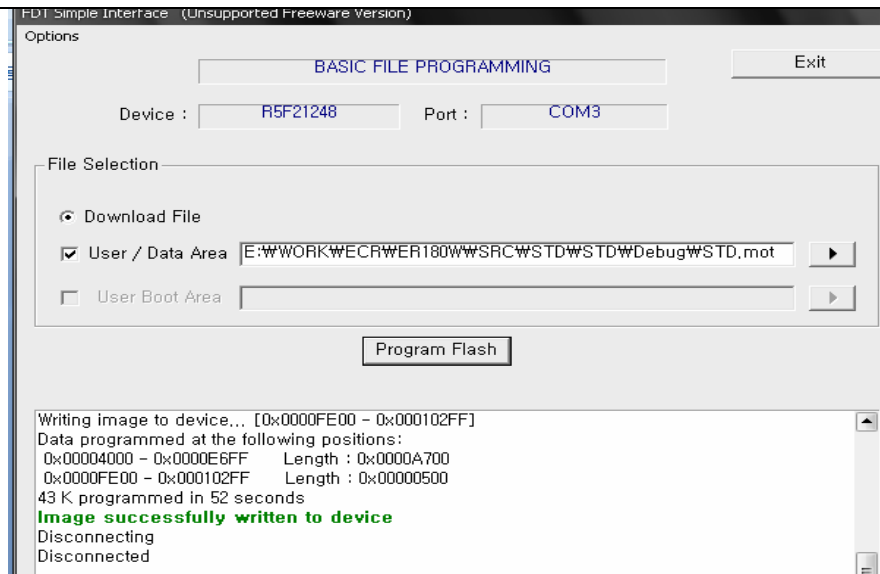
No	Description
	– Select connected port of your PC and press “ Next button” . 
8	– Select communication speed. Uncheck “ Use default” and set “ 115200” to the “ Recommended speeds” and press “ Next button” . 

3-1-3. Program Download

No	Description
9	– Press “ Finish” button.  – Select the downloaded file. Check the Download File and “ User/Data Area” . Press arrow button and open “ ER-180 MOT” file.  Flash Development Toolkit and flash programming components are provided without support A sunnorted release is also available from Benesas – After selecting downloaded file then press “ Program Flash” . If you see “ ID Check” dialog, then press OK.

3. Installation and Operation

	
No	Description
9	– See the progress bar is going as below picture.  – If downloading is successful, green color “ Image successfully written to device” will displayed as below.



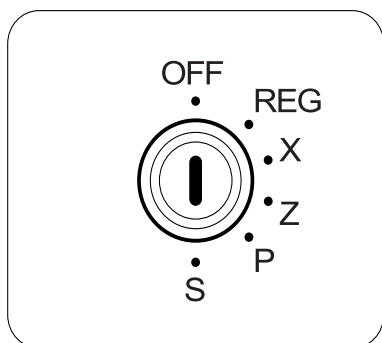
- Unplug the DC power cord.
- Move the black dip switch cap to the right position(default position)
- Reassemble drawer and assemble the screw as original status.
- Plug the DC power cord.
- Do the RAM ALL CLEAR and program other settings again (date and time..)

3-2 Operation

Note : Before using Electronic Cash Register (ECR) for the first time, Insert the battery (AA-type*3pcs) into battery case. And fulfill “MEMORY ALL CLEAR” procedure.

3-2-1 Mode

The position of the Mode determines the action of the ECR. The modes are as shown in Table 3-3



Mode	Function
OFF	Operation stop
REG	Sales Operation
X	X-level report generation
Z	Z-level report generation
PGM	Program mode
S	Use for H/W tests

Table3-1 Mode Function

3-2 Operation

3-2-2 Key Board Matrix

FEED	CLEAR	PLU	X/TIME (X)	RCPT ON/OFF C/CONV	—	— %	+ %	NO SALE	CALC
RETURN	7	8	9	1	5	9	13	RA (+)	PO (-)
VOID	4	5	6	2	6	10	14	CHECK	CHARGE
CLERK	1	2	3	3	7	11	15	SUB TOTAL	
TAX	0	00	.	4	8	12	16	CASH / TEND (=)	

Figure 3-2. Key Board

3-2 Operation

3-2-3 All Clear

WARNING: This is a one time procedure. Do not repeat this procedure after the cash register is programmed, it causes all programs and totals to be erased and to be default.

PROCEDURE

1. Move the Mode switch to the "S" position.
2. Connect the AC Power Plug into a power outlet while pressing the "00" keys.
3. After clearing all RAM memory, the register prints the following line:



Figure3-3. All Clear Key Sequence & Print Sheet

3-2 Operation

3-2-4 Self Test

3-2-4-(a) Test Printer

1. Turn the Mode Key to "S" position.
2. Press '1', '0' and 'SUB TOTAL' key on key board.
3. Then the printer prints the test pattern.
4. After printing, The drawer is opened. Then the printer test is finished.

3-2-4-(b) Test Display

1. Turn the Mode Key to "S" position.
2. Press '1', '1' and 'SUB TOTAL' key on key board.
3. Check the Display.

3-2-4-(c) Test Key Board

1. Turn the Mode Key to "S" position.
2. Press '1', '2' and 'SUB TOTAL' key on key board.
3. Press each key on the keyboard one key at the time.
As you press each key. The Display shows the key's location code.

3-2-4-(d) Test Mode Key

1. Turn the Mode Key to "S" position.
2. Press '1', '3' and 'SUB TOTAL' key on key board.
3. Turn the Mode key and check the display.

4 Assembly and Disassembly

This chapter describes the Disassembly and Reassembly procedures.

WARNING: This ECR contains electro-statically sensitive devices.
Use caution when handling any components in this system.

4-1 Disassembly

CAUTION: Disconnect the ECR from the external power source before Disassembly.

A. Disassembly Procedure

1. Separate the COVER PRINTER ASSEMBLY(①). (Page 5-1)
2. Remove a screw (⑪) on the CASE UPPER (⑫) and pull it forward and up and then the CASE UPPER (⑫) will be open. (Page 5-1)
3. Remove the DRAWER CONNECTOR (⑨) on the MAIN BOARD (⑳). (Page 5-1)
4. Separate the DRAWER (B) from the CASE UPPER(⑫). (Page 5-1)
5. Separate the seven harnesses (a,b,c,d,e,f,h) can be removed from the MAIN BOARD(㉑).
6. Separate the BATTERY SPRING(㉒) from the CASE UPPER(⑫). (Page 5-1)
7. Separate the HOLDER MOTOR (⑮) and POWER CONNECTOR (⑱) from the CASE UPPER(⑫). (Page 5-1)
8. Remove four screws (㉓,㉔) on the CASE UPPER (⑫) and Separate the PRINTER ASSEMBLY(㉕) and MAIN BOARD(㉖) from the CASE UPPER(⑫). (Page 5-1)
9. Remove two screws (⑯) on the COVER DISPLAY (⑥) and Separate the DISPLAY BOARD(㉗), from the CASE UPPER(⑫). (Page 5-1)
10. Remove three screws (⑰) on the CASE UPPER (⑫) and Separate the KEYBOARD ASSEMBLY(㉘), from the CASE UPPER(⑫). (Page 5-1)
11. Separate the COVER DISPLAY (⑥) from the CASE UPPER(⑫). (Page 5-1)
12. Remove two screws (⑩) on the CASE UPPER (⑫) and Separate the MODE SWITCH(⑬), from the CASE UPPER(⑫). (Page 5-1)

B. Reassembly Procedure

- Reassembly procedure is in reverse order.

Memo

5 Exploded View and Parts List

[Exploded View]

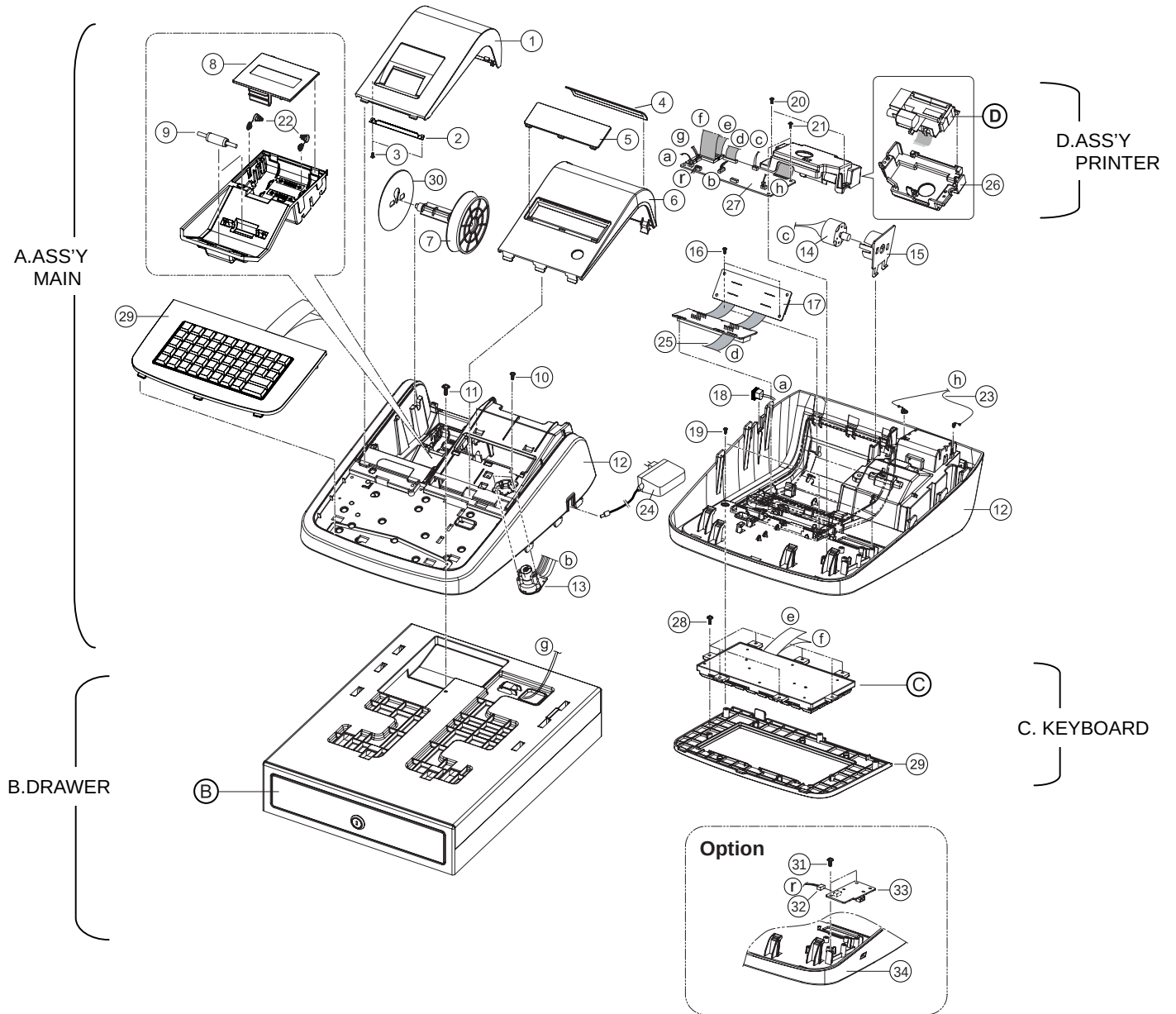


Figure 5-1. Total Disassembly

5. Exploded View and Parts List

A. ASS'Y MAIN

No	Parts-No.	Description/Specification	Q'ty	Design-Location	Serviceable	Remark
1	JK72-20379A	PMO-COVER PRINTER	1		Y	
2	JK70-20152A	IPR-CUTTER PAPER	1		Y	
3	JK70-50011A	SCREW-TAPPING:PH,M2,L4	2		Y	
4	JK72-20385A	PMO-WINDOW REAR	1		Y	
5	JK72-20384A	PMO-WINDOW FRONT	1		Y	
6	JK72-20378A	PMO-COVER DISPLAY	1		Y	
7	JK72-20015A	PMO-SPOOL WINDING	1		Y	
8	JK72-20377A	PMO-COVER BATTERY	1		Y	
9	JK72-40330A	PMO-ROLLER PAPER/END	2		Y	
10	6002-000174	SCREW-TAPPING:PWH,M3,L10	2	C/UPPER + MODE KEY ASS'Y	Y	
11	JK70-50056A	SCREW-TAPPING:PWH,M4,L10	1	C/UPPER+B DRAWER	Y	
	6003-001149	SCREW-TAPTITE:PWH,M4,L10	1	C/UPPER+G DRAWER(OPTION)	Y	
12	JK72-20376A	PMO-CASE UPPER	1		Y	
13	JK96-01001B	ELA UNIT-MODE S/W	1		Y	
14	JK96-00937C	ELA-MOTOR	1		Y	
15	JK72-40932B	PMO-HOLDER MOTOR	1		Y	
16	JK70-50026A	SCREW-TAPPING:PWH,M2.6,L8	2	C/DISPLAY + R/DISPLAY PCB	Y	
17	JK92-01647A	PBA-DISPLAY:DUAL	1		Y	OPTION
	JK92-01648A	PBA-DISPLAY:FRONT	1		Y	
18	JK39-40800A	HARNESS-POWER	1		Y	
19	6002-000174	SCREW-TAPPING:PWH,M3,L10	3	C/UPPER + KEYBOARD ASS'Y	Y	
20	6002-000174	SCREW-TAPPING:PWH,M3,L10	2	C/UPPER + PRINTER ASS'Y	Y	
21	6002-000174	SCREW-TAPPING:PWH,M3,L10	2	C/UPPER + MAIN PCB	Y	
22	JK70-30023A	SPRING BATTERY 2	2	C/UPPER	Y	
23	JK97-20115A	ASSY-SPRING BATTERY	1		Y	
24	JK44-30507A	ADAPTOR:EUROPE	1		Y	
	JK44-30507B	ADAPTOR:USA	1		Y	
	JK44-30507C	ADAPTOR:AUSTRALIA	1		Y	
	JK44-30507D	ADAPTOR:UK	1		Y	
25	JK39-40803A	HAR-DISPLAY FFC:ER180,16P,130mm	1		Y	
26	JK72-20382A	PMO-HOLDER PRINTER(W)	1		Y	
27	JK92-01645A	PBA MAIN-BOARD	1		Y	
28	6002-000175	SCREW-TAPPING:PWH,M3,L8	7	KEYBOARD + KBD HOUSING	Y	
29	JK72-20389A	PMO-KBD HOUSING	1		Y	
30	JK72-20016A	PMO-GUIDE WINDING	1		Y	
31	6002-000174	SCREW-TAPPING:PWH,M3,L10	2	C/UPPER + CIGAR PCB	Y	OPTION
32	JK39-40805A	HARNESS-CIGAR JACK	1		Y	OPTION
33	JK92-01649A	PBA-CIGARJACK:ER-180,OPTION	1		Y	OPTION
34	JK72-20376C	PMO-CASE UPPER	1		Y	OPTION

B. DRAWER (B-TYPE) – BOTTOM : MOLD LOCK

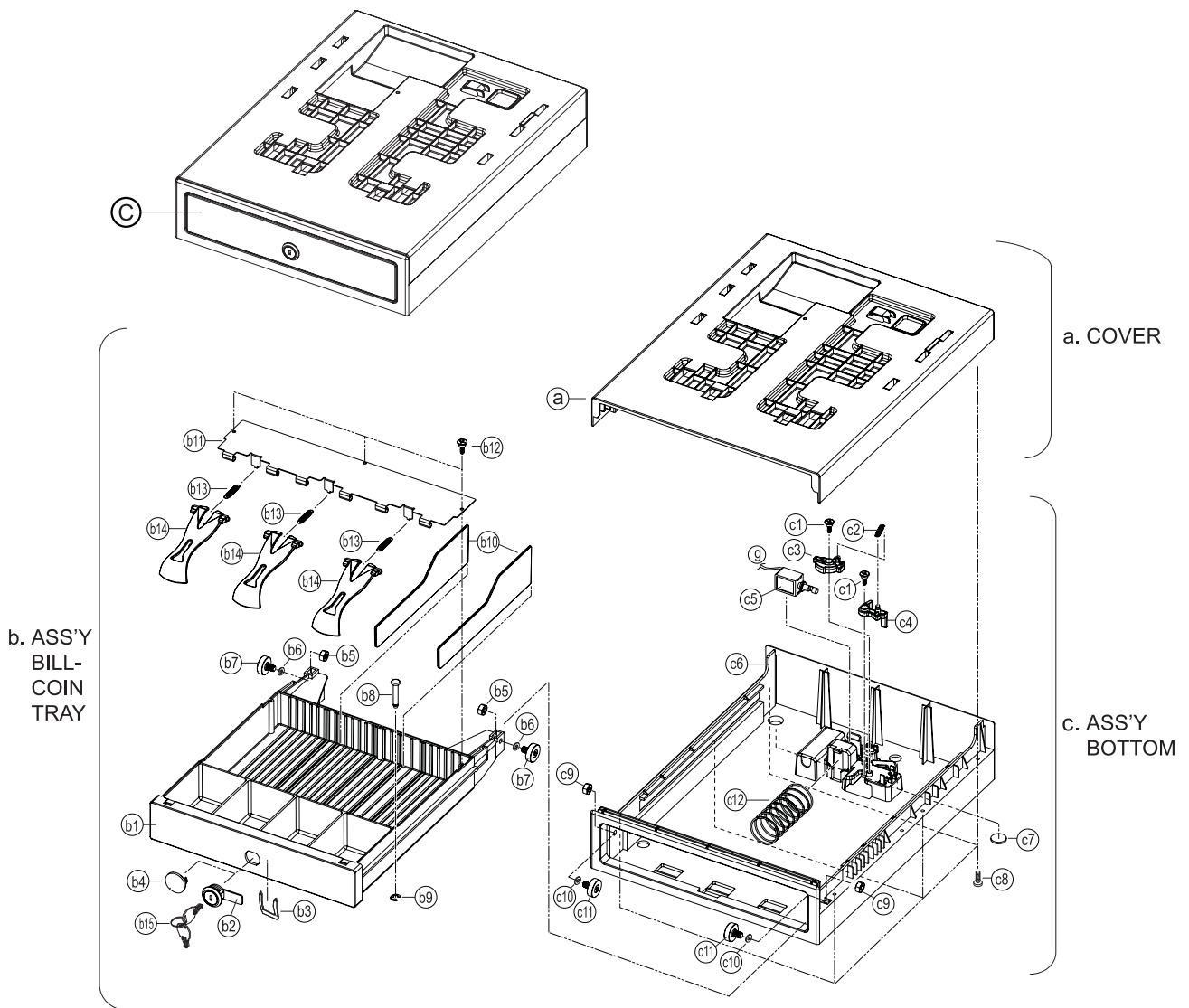


Figure 5-2. B-TYPE DRAWER (BOTTOM : MOLD LOCK)

5. Exploded View and Parts List

B. DRAWER (B-TYPE) – BOTTOM : MOLD LOCK

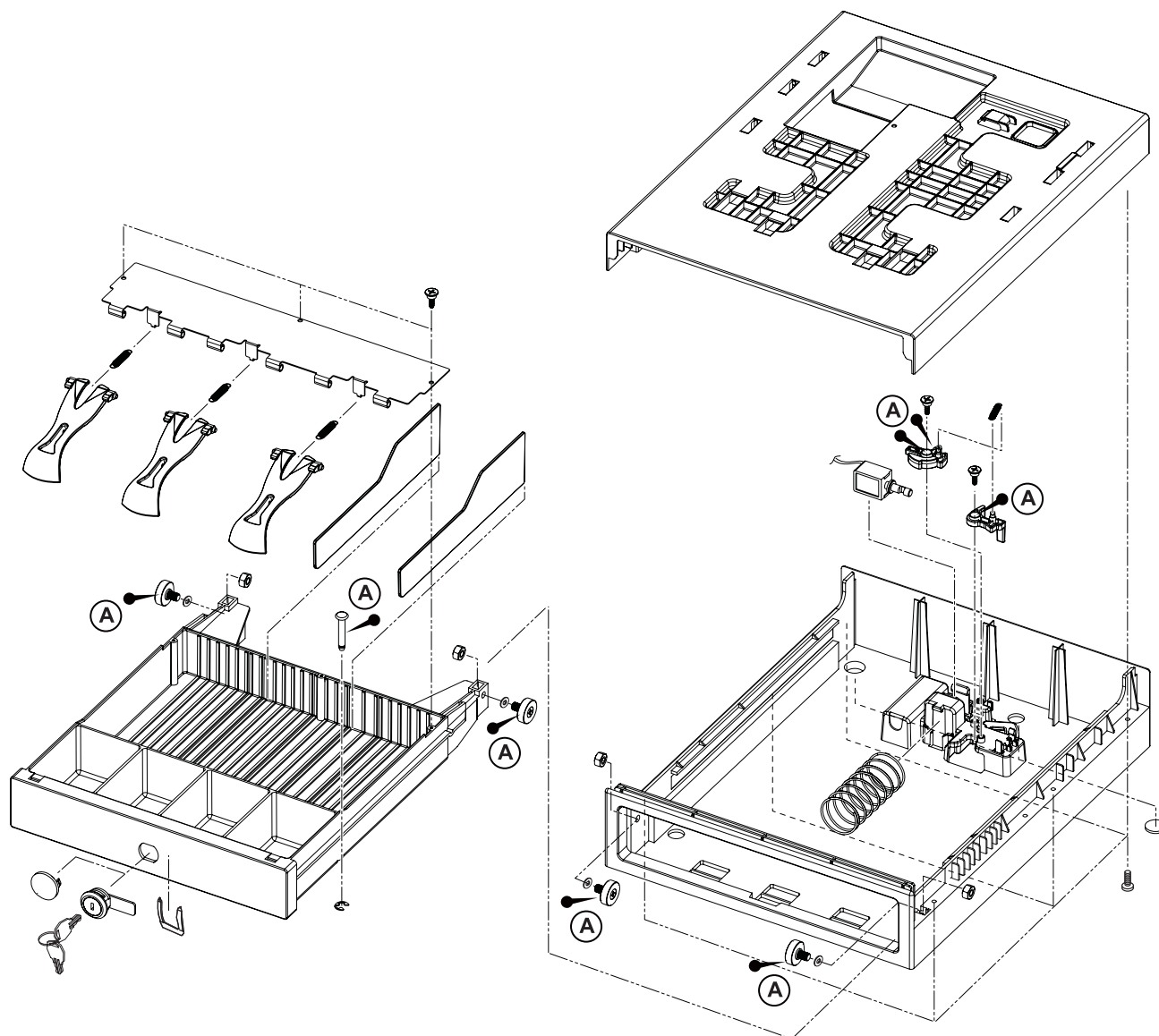


Figure 5-3. Lubrication Points of the B-TYPE Drawer (BOTTOM : MOLD LOCK)

No.	Code No.	Description / Specification	Q'ty	Serviceable	Remark
A	0201-002010	GREASE-N2	-	Y	Minimum Serviceable Packing Weight : 40g

B. DRAWER (B-TYPE) –BOTTOM : MOLD LOCK**DRAWER**

No	Parts-No.	Description/Specification	Q'ty	Design-Location	Serviceable	Remark
C	JK75-20104A	MEC-DRAWER B43ND:3B4C,7V,BLK	1	MOLD LOCK ASS'Y	Y	
	JK75-20105A	MEC-DRAWER B44ND:4B4C,7V,BLK	1		Y	
	JK75-20097A	MEC-DRAWER B43LD:3B4C,7V,BLK,KEY	1		Y	OPTION
	JK75-20099A	MEC-DRAWER B44LD:4B4C,7V,BLK,KEY	1		Y	OPTION

a. ASS'Y COVER

No	Parts-No.	Description/Specification	Q'ty	Design-Location	Serviceable	Remark
a	JK72-20386A	PMO-COVER HOUSING	1		Y	

b. ASS'Y BILL-COIN TRAY

No	Parts-No.	Description/Specification	Q'ty	Design-Location	Serviceable	Remark
b1	JK72-40242C	PMO-BILL_COIN TRAY			Y	
b2	JK75-10389A	MEC-LOCK	1		Y	OPTION
b3	JK70-10323A	IPR-PLATE CLIP	1		Y	OPTION
b4	JK72-40241C	PMO-DRAWER BUSHING KEY	1		Y	
b5	6021-000225	NUT-HEXAGON	2		Y	
b6	6031-000243	WASHER-PLAIN	2		Y	
b7	JK75-10386A	MEC-ROLLER(Ø19)	2		Y	
b8	JK70-40302A	ICT-SHAFT PIN	1		Y	
b9	6044-000124	RING-E	1		Y	
b10	JK72-40240C	PMO-BILL PARTITION	3(4)		Y	
b11	JK70-20119A	IPR-PLATE HOLDER_B3	1		Y	
	JK70-20120A	IPR-PLATE HOLDER_B4	1		Y	
b12	6002-000193	SCREW-TAPPING :RH,M3,L6	3		Y	
b13	JK70-30014B	SPRING-LEVER PRESS(MD)	3(4)		Y	
b14	JK72-20259A	PMO-LEVER PRESS	3(4)		Y	
b15	JK70-20025B	IPR-KEY DRAWER	1		Y	OPTION

c. ASS'Y BOTTOM

No	Parts-No.	Description/Specification	Q'ty	Design-Location	Serviceable	Remark
c1	JK70-50115A	SCREW-TAPPING SPECIAL	2		Y	
c2	6107-001041	SPRING-LOCK LEVER	1		Y	
c3	JK72-20387A	PMO-LATCH 1	1		Y	
c4	JK72-20388A	PMO-LATCH 2	1		Y	
c5	JK33-10501A	SOLENOID-DC	1		Y	
c6	JK72-40375C	PMO-COVER BOTTOM	1		Y	
c7	JK61-40201A	FOOT	2		Y	
c8	6002-000175	SCREW-TAPPING	6		Y	
c9	6021-000225	NUT-HEXAGON	2		Y	
c10	6031-000243	WASHER-PLAIN	2		Y	
c11	JK75-10386A	MEC-ROLLER	2		Y	
c12	JK70-30024A	SPRING-PUSH	1		Y	

B. DRAWER (B-TYPE) - BOTTOM : STEEL LOCK

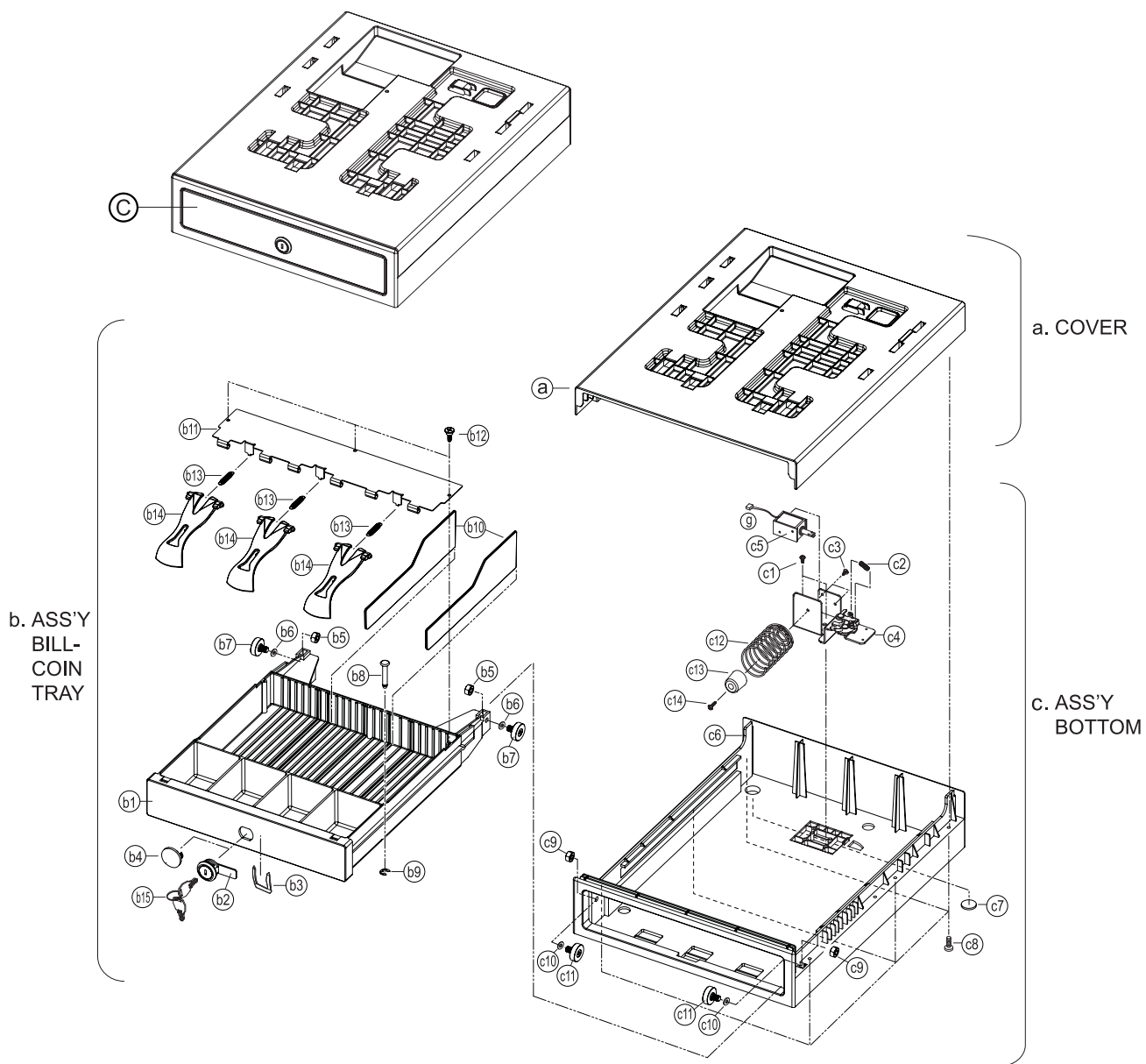


Figure 5-2. B-TYPE DRAWER (BOTTOM : STEEL LOCK)

B. DRAWER (B-TYPE) – BOTTOM : STEEL LOCK

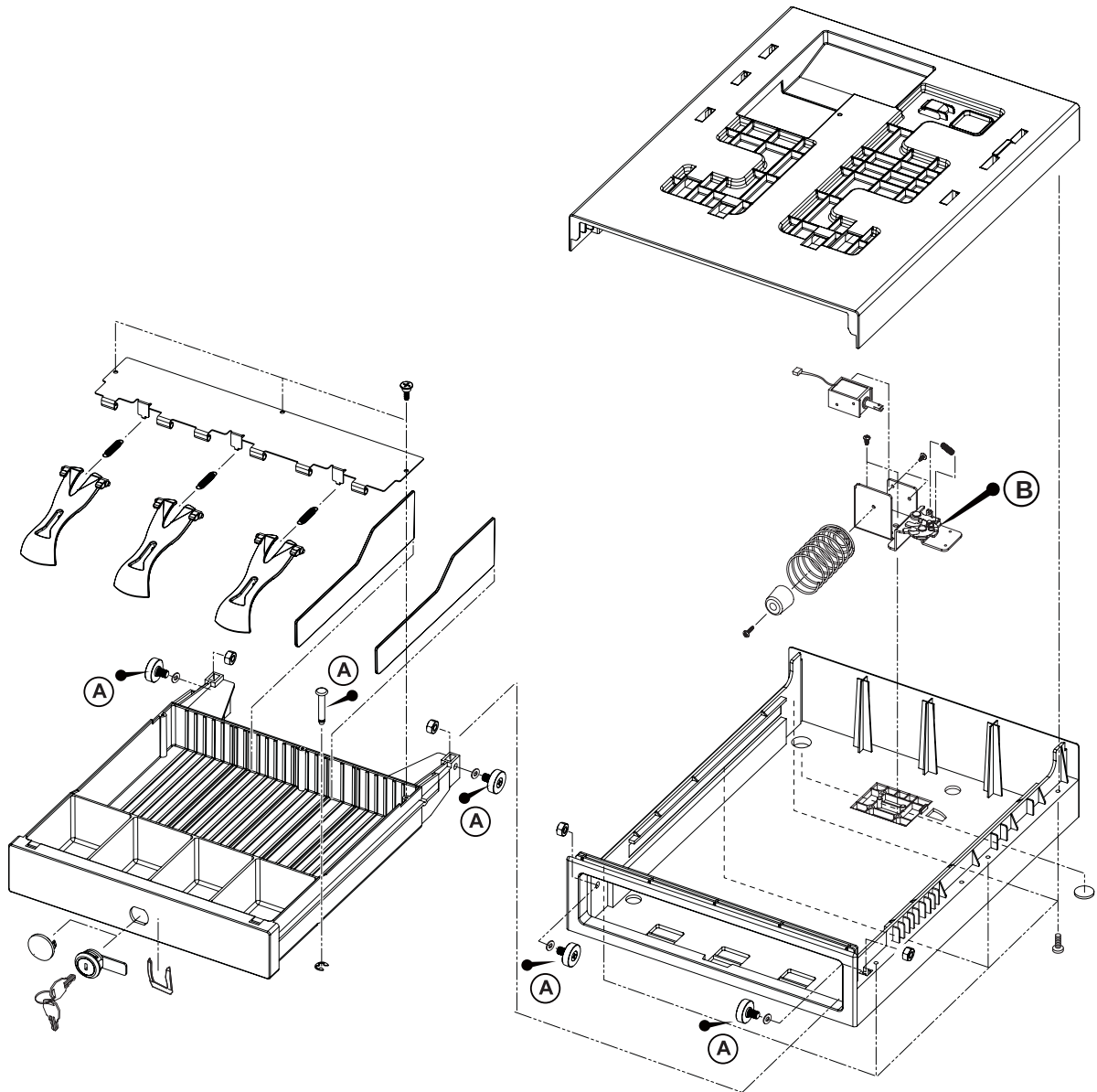


Figure 5-3. Lubrication Points of the B-TYPE Drawer (BOTTOM : STEEL LOCK)

No.	Code No.	Description / Specification	Q'ty	Serviceable	Remark
A	0201-002010	GREASE-N2	-	Y	Minimum Serviceable Packing Weight : 40g
B	0201-002009	GREASE-N1	-	Y	Minimum Serviceable Packing Weight : 40g

5. Exploded View and Parts List

B. DRAWER (B-TYPE) - BOTTOM : STEEL LOCK

DRAWER

No	Parts-No.	Description/Specification	Q'ty	Design-Location	Serviceable	Remark
C	JK75-20104B	MEC-DRAWER B43ND2:3B4C,7V,BLK	1	STEEL LOCK ASS'Y	Y	
	JK75-20105B	MEC-DRAWER B44ND2:4B4C,7V,BLK	1		Y	
	JK75-20097B	MEC-DRAWER B43LD2:3B4C,7V,BLK,KEY	1		Y	OPTION
	JK75-20099B	MEC-DRAWER B44LD2:4B4C,7V,BLK,KEY	1		Y	OPTION

a. ASS'Y COVER

No	Parts-No.	Description/Specification	Q'ty	Design-Location	Serviceable	Remark
a	JK72-20386A	PMO-COVER HOUSING	1		Y	

b. ASS'Y BILL-COIN TRAY

No	Parts-No.	Description/Specification	Q'ty	Design-Location	Serviceable	Remark
b1	JK72-40242C	PMO-BILL_COIN TRAY			Y	
b2	JK75-10389A	MEC-LOCK	1		Y	OPTION
b3	JK70-10323A	IPR-PLATE CLIP	1		Y	OPTION
b4	JK72-40241C	PMO-DRAWER BUSHING KEY	1		Y	
b5	6021-000225	NUT-HEXAGON	2		Y	
b6	6031-000243	WASHER-PLAIN	2		Y	
b7	JK75-10386A	MEC-ROLLER(Ø19)	2		Y	
b8	JK70-40302A	ICT-SHAFT PIN	1		Y	
b9	6044-000124	RING-E	1		Y	
b10	JK72-40240C	PMO-BILL PARTITION	3(4)		Y	
b11	JK70-20119A	IPR-PLATE HOLDER_B3	1		Y	
	JK70-20120A	IPR-PLATE HOLDER_B4	1		Y	
b12	6002-000193	SCREW-TAPPING :RH,M3,L6	3		Y	
b13	JK70-30014B	SPRING-LEVER PRESS(MD)	3(4)		Y	
b14	JK72-20259A	PMO-LEVER PRESS	3(4)		Y	
b15	JK70-20025B	IPR-KEY DRAWER	1		Y	OPTION

c. ASS'Y BOTTOM

No	Parts-No.	Description/Specification	Q'ty	Design-Location	Serviceable	Remark
c	JK97-20093K	MEA-UNIT LOCK(7V)	1		Y	
	JK97-20093L	MEA-UNIT LOCK(7V,COM)	1		Y	
c1	6001-000525	SCREW-MACHINE: M3,L14	2		Y	
c2	6107-001041	SPRING-LOCK LEVER	1		Y	
c3	JK70-50079A	SCREW-TAPTITE: M3,L5	2		Y	
c4	JK97-01080B	MEC-SUB LOCK	1		N	
c5	JK27-10500C	SOLENOID-DC: 7V	1		Y	
c6	JK72-40375C	PMO-COVER BOTTOM	1		Y	
c7	JK61-40201A	FOOT	2		Y	
c8	6002-000175	SCREW-TAPPING	6		Y	
c9	6021-000225	NUT-HEXAGON	2		Y	
c10	6031-000243	WASHER-PLAIN	2		Y	
c11	JK75-10386A	MEC-ROLLER	2		Y	
c12	JK70-30019A	SPRING-PUSH	1		Y	
c13	JK70-50090A	PLAIN-WASHER	1		Y	
c14	JK70-50092A	SCREW-TAPTITE: M5,L10	1		Y	

B. DRAWER (G-TYPE)

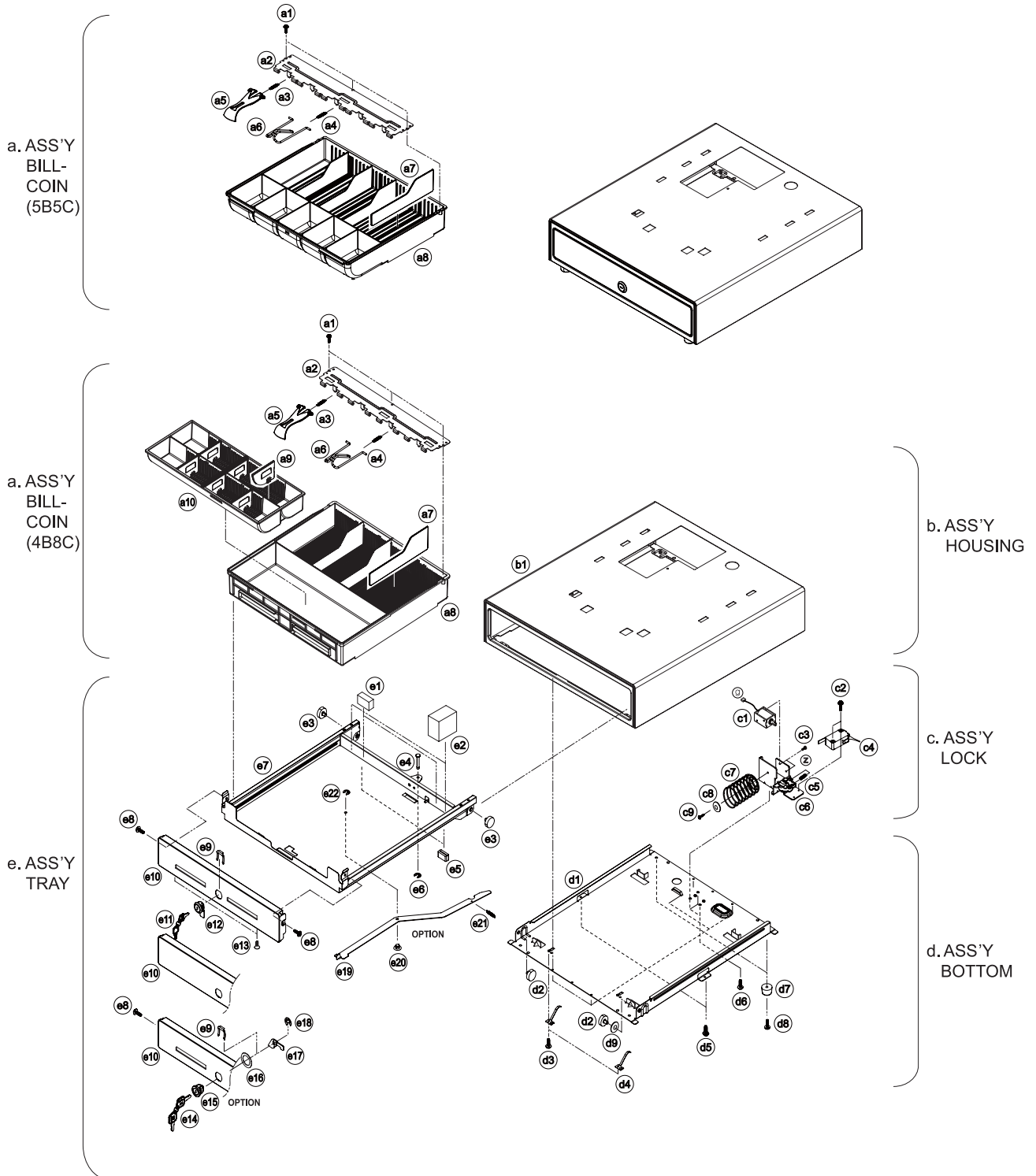


Figure 5-4. G-TYPE DRAWER

5. Exploded View and Parts List

B. DRAWER (G-TYPE)

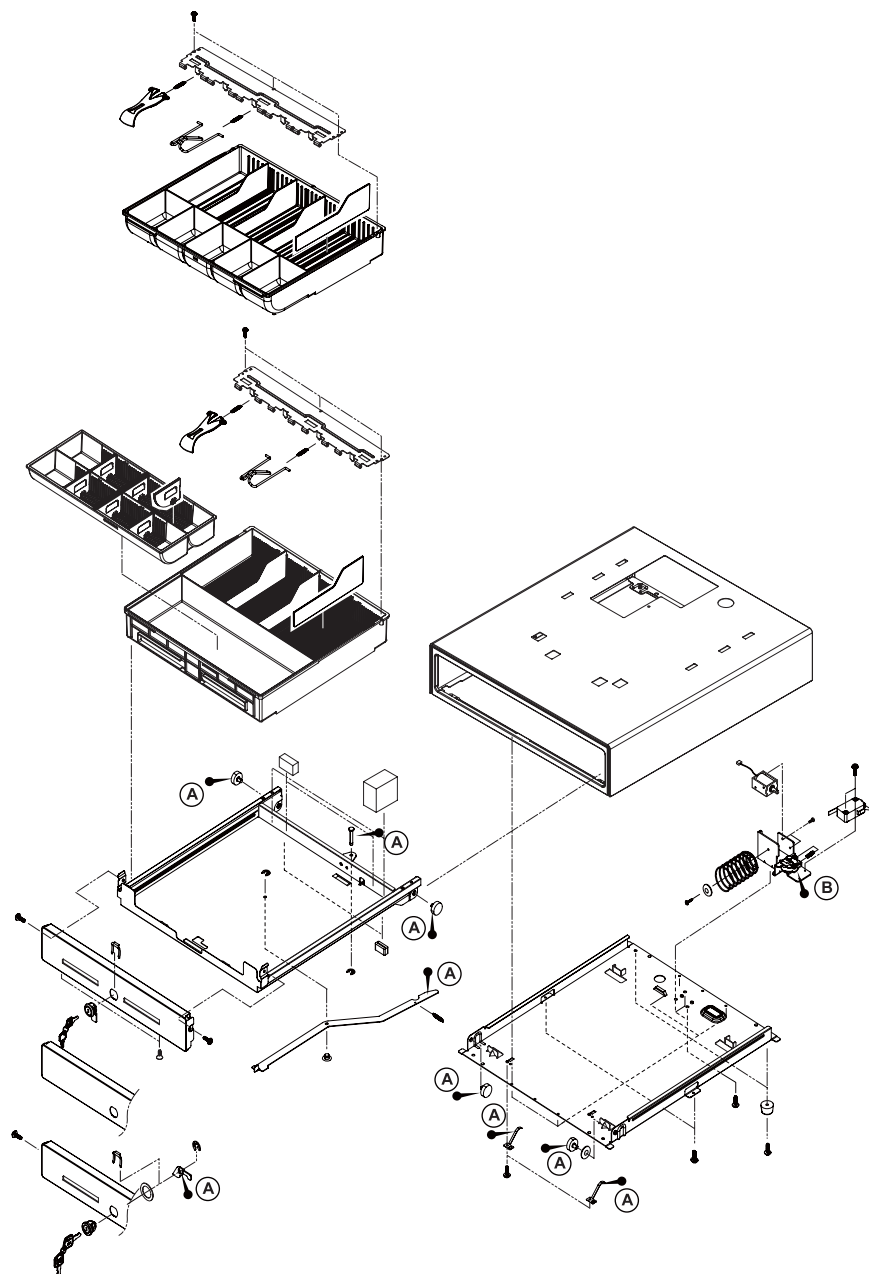


Figure 5-5. Lubrication Points of the G-TYPE Drawer

No.	Code No.	Description / Specification	Q'ty	Serviceable	Remark
A	0201-002010	GREASE-N2	-	Y	Minimum Serviceable Packing Weight : 40g
B	0201-002009	GREASE-N1	-	Y	Minimum Serviceable Packing Weight : 40g

B. DRAWER (G-TYPE)**DRAWER**

No	Parts-No.	Description/Specification	Q'ty	Design-Location	Serviceable	Remark
C	JK75-20102BN	MEC-DRAWER G84NPB-7V:4B8C,NO COM	1		Y	
	JK75-20103BN	MEC-DRAWER G55NPB-7V:4B8C,NO COM	1		Y	

a. ASS'Y BILL-COIN(5B5C)

No.	Code No.	Description / Specification	Q'ty	Design-Location	Serviceable	Remark
a1	6002-000175	SCREW-TAPPING : M3,L8	3		Y	
a2	JK70-20113A	IPR-HOLDER PLATE(5B5C)	1		Y	
a3	JK70-30014B	SPRING-LEVER PRESS(MD)	4		Y	
a4	JK70-30015A	SPRING-LEVER PRESS(PD)	4		Y	OPTION
a5	JK72-20259A	PMO-LEVER PRESS	4		Y	
a6	JK70-20067A	IPR-LEVER PRESS	4		Y	OPTION
a7	JK72-40269A	PMO-BILL PARTITION	3		Y	
a8	JK72-40268A	PMO-BILL COIN TILL : 4B8C	1		Y	

a. ASS'Y BILL-COIN(4B8C)

No.	Code No.	Description / Specification	Q'ty	Design-Location	Serviceable	Remark
a	JK97-20094B	MEA-UNIT BILL COIN(4B8C,PLASTIC)	1		Y	
a1	6002-000175	SCREW-TAPPING : M3,L8	3		Y	
a2	JK70-20114A	IPR-HOLDER PLATE(4B8C)	1		Y	
a3	JK70-30014B	SPRING-LEVER PRESS(MD)	4		Y	
a4	JK70-30015A	SPRING-LEVER PRESS(PD)	4		Y	OPTION
a5	JK72-20259A	PMO-LEVER PRESS	4		Y	
a6	JK70-20067A	IPR-LEVER PRESS	4		Y	OPTION
a7	JK72-40269A	PMO-BILL PARTITION	3		Y	
a8	JK72-20088A	PMO-BILL COIN TILL : 4B8C	1		Y	
a9	JK72-20090A	PMO-COIN PARTITION	6		Y	
a10	JK72-20089A	PMO-COIN TILL	1		Y	

b. ASS'Y HOUSING

No.	Code No.	Description / Specification	Q'ty	Design-Location	Serviceable	Remark
b	JK97-20095J	MEA-UNIT HOUSING(STD,BLK)	1		N	

c. ASS'Y LOCK

No.	Code No.	Description / Specification	Q'ty	Design-Location	Serviceable	Remark
c	JK97-20093K	MEA-UNIT LOCK(7V)	1		Y	
	JK97-20093L	MEA-UNIT LOCK(7V,COM)	1		Y	
c1	JK27-10500C	SOLENOID-DC: 7V	1		Y	
c2	6001-000525	SCREW-MACHINE: M3,L14	2		Y	
c3	JK70-50079A	SCREW-TAPTITE: M3,L5	2		Y	
c4	JK39-40301R	CBF HARNESS MICRO S/W	1		Y	
c5	6107-001041	SPRING-LOCK LEVER	1		Y	
c6	JK97-01080B	MEC-SUB LOCK	1		N	
c7	JK70-30019A	SPRING-PUSH	1		Y	
c8	JK70-50090A	PLAIN-WASHER	1		Y	
c9	JK70-50092A	SCREW-TAPTITE: M5,L10	1		Y	

5. Exploded View and Parts List

B. DRAWER (G-TYPE)

d. ASS'Y BOTTOM

No.	Code No.	Description / Specification	Q'ty	Design-Location	Serviceable	Remark
d	JK97-20096A	MEA-UNIT BOTTOM(5B5C)	1		N	
	JK97-20096B	MEA-UNIT BOTTOM(4B8C)	1		N	
d1	JK70-20115A	IPR-BOTTOM PLATE(5B5C)	1		N	
	JK70-20115B	IPR-BOTTOM PLATE(4B8C)	1		N	
d2	JK75-20068A	MEC-ROLLER(Φ 22)	2		Y	
d3	6003-000266	SCREW-TAPTITE: M3,L6	2		Y	
d4	JK70-10401A	IPR-PLATE GROUND	2		Y	
d5	6003-000266	SCREW-TAPTITE: M3,L6	6		Y	
d6	JK70-50092A	SCREW-TAPTITE: M5,L10	3		Y	
d7	JK61-40200B	FOOT-RUBBER: BALCK	4		Y	
d8	6002-000234	SCREW-TAPPING: M4,L16	4		Y	
d9	JK70-50093A	PLAIN-WASHER	1		Y	

e. ASS'Y TRAY

No.	Code No.	Description / Specification	Q'ty	Design-Location	Serviceable	Remark
e	JK97-20097E	MEA-UNIT TRAY TILL(5B5C,BLK,UNV)	1		N	
	JK97-20097F	MEA-UNIT TRAY TILL(5B5C,BLK,UNV,MANUAL OPEN)	1		N	
	JK97-20098C	MEA-UNIT TRAY TILL(4B8C,BLK)	1		N	
	JK97-20098D	MEA-UNIT TRAY TILL(4B8C,BLK, MANUAL OPEN)	1		N	
e1	JK73-10203A	RMO-TENSION	2		Y	
e2	JK73-30901A	RMO-SPONGE(UNIVESAL)	2		Y	
e3	JK75-20068A	MEC-ROLLER(Φ 22)	2		Y	
e4	JK70-40302A	ICT-SHAFT PIN	1		Y	
e5	JK70-60041A	RMO-RUBBER STOPPER	2		Y	
e6	6044-000124	RING-E: ID3	1		Y	
e7	JK97-20100A	MEA-TRAY TILL	1		N	
e8	6003-000266	SCREW-TAPTITE: M3,L6	2		Y	
e9	JK70-10323A	IPR-PLATE CLIP	1		Y	
e10	JK70-20108B	IPR-FRONT PANEL(5B5C,BLK)	1		Y	
	JK70-20108D	IPR-FRONT PANEL(4B8C,BLK)	1		Y	
e11	JK70-20025B	IPR-KEY DRAWER	1SET		Y	
e12	JK75-20067A	MEC-KEY LOCK	1		Y	
e13	JK70-50094A	SCREW-TAPTITE: M3,L8	2		Y	
e14	JK70-20075A	IPR-KEY DRAWER: #2424	1SET		Y	OPTION
e15	JK75-20041A	MEC-KEY LOCK: #2424	1		Y	OPTION
e16	JK70-20120A	IPR-DUMMY KEY	1		Y	OPTION
e17	JK70-20074A	IPR-LEVER LOCK	1		Y	OPTION
e18	6044-000124	RING-E: ID3	1		Y	OPTION
e19	JK70-20116A	IPR-LEVER PUSH	1		Y	OPTION
e20	JK70-40905A	ICT-SHAFT LEVER PUSH	1		Y	OPTION
e21	JK70-30020A	SPRING-LEVER PUSH	1		Y	OPTION
e22	6044-000231	RING-E: ID5	1		Y	OPTION

C. ASS'Y KEYBOARD (LASER PRINTING TYPE)

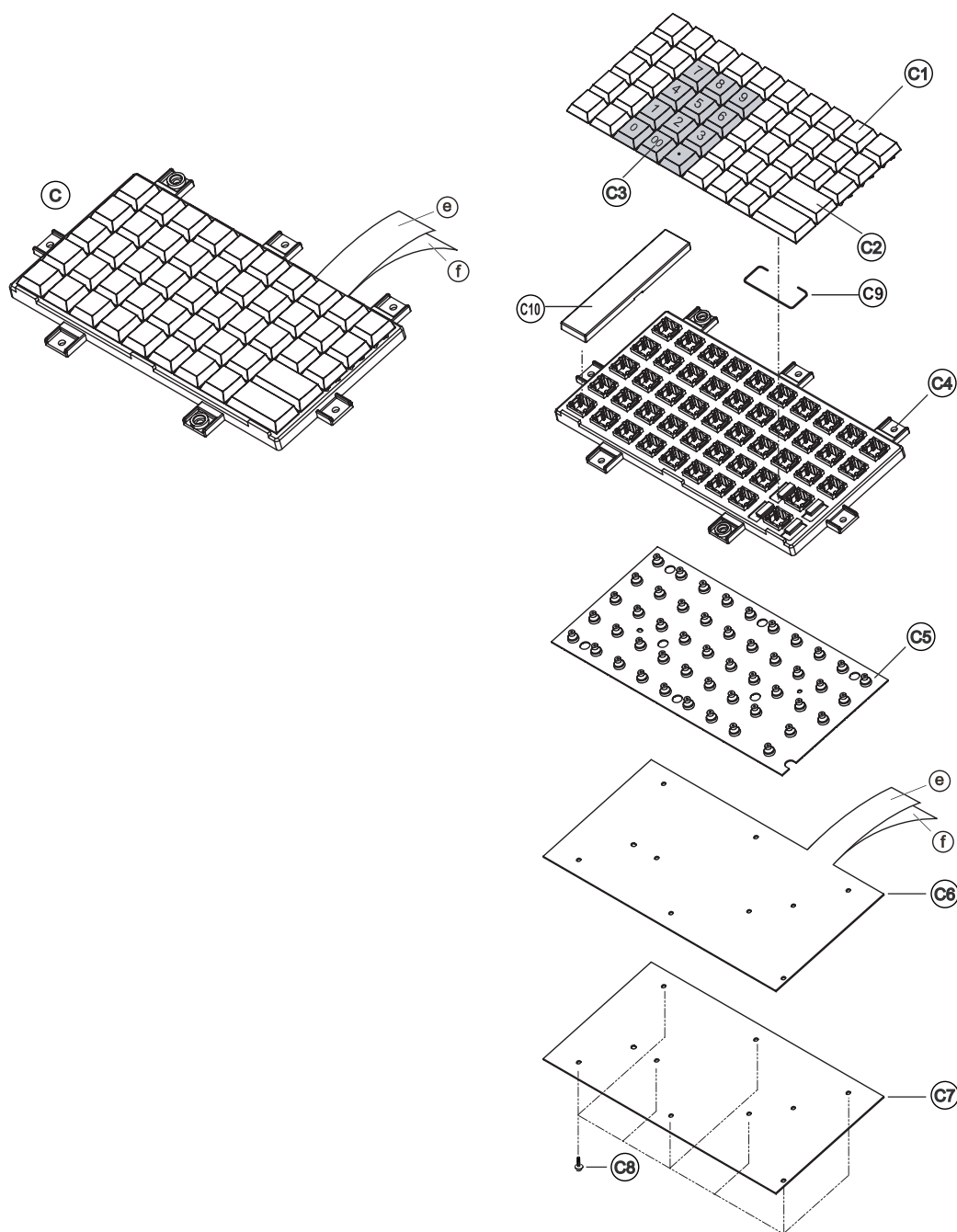


Figure 5-6 ASS'Y KEYBOARD (LASER PRINTING TYPE)

5. Exploded View and Parts List

C. ASS'Y KEYBOARD (LASER PRINTING TYPE)

No.	Code No.	Description/ Specification	Q'ty	Design-Location	Serviceable	Remark
C	JK59-30040A	UNIT-KEYBOARD: ER-180(STD)	1		Y	
C1	JK81-20085A	PMO-KEY TOP 1×1	34		Y	
C2	JK81-20086A	PMO-KEY TOP 1×2	2		Y	
C3	JK81-20094A	PMO-KEY TOP SET:0~9	1		Y	
C4	JK81-20084A	PMO-KEYBOARD FRAME	1		Y	
C5	JK81-20092A	REX-CONTACT RUBBER	1		Y	
C6	JK81-20083A	ASSY-FPC,230	1		Y	
C7	JK81-20091A	IPR-BOTTOM PLATE	1		Y	
C8	JK81-20076A	SCREW TAPPING(BH):M2X5	8		Y	
C9	JK81-20095A	BALANCE-BAR	2		Y	
C10	JK72-20390A	PMO-BLANK KEY TOP	1		Y	

C. ASS'Y KEYBOARD (LABEL TYPE)

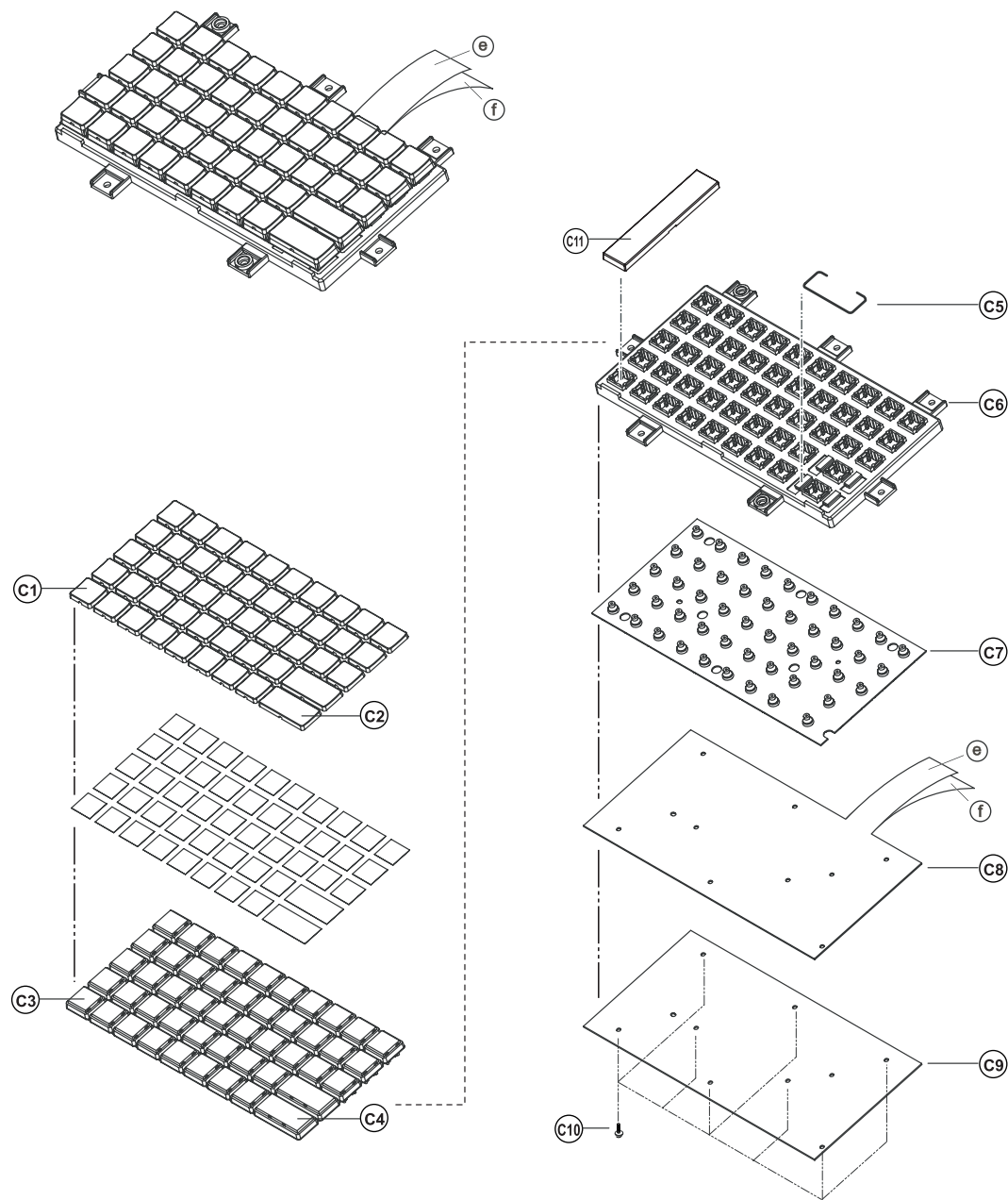


Figure 5-7 ASS'Y KEYBOARD (LABEL TYPE)

5. Exploded View and Parts List

C. ASS'Y KEYBOARD (LABEL TYPE)

No.	Code No.	Description/ Specification	Q'ty	Design-Location	Serviceable	Remark
C	JK59-30042A	UNIT-KEYBOARD: ER-180(STD)	1		Y	
C1	JK81-20089A	PMO-KEY TOP 1×1	46		Y	
C2	JK81-20090A	PMO-KEY TOP 1×2	2		Y	
C3	JK81-20087A	PMO-KEY CAP 1×1	46		Y	
C4	JK81-20089A	PMO-KEY CAP 1×2	2		Y	
C5	JK81-20095A	BALANCE-BAR	2		Y	
C6	JK81-20084A	PMO-KEYBOARD FRAME	1		Y	
C7	JK81-20092A	REX-CONTACT RUBBER	1		Y	
C8	JK81-20083A	ASSY-FPC,230	1		Y	
C9	JK81-20091A	IPR-BOTTOM PLATE	1		Y	
C10	JK81-20076A	SCREW TAPPING(BH):M2X5	8		Y	
C11	JK72-20390A	PMO-BLANK KEY TOP	1		Y	



5. Exploded View and Parts List

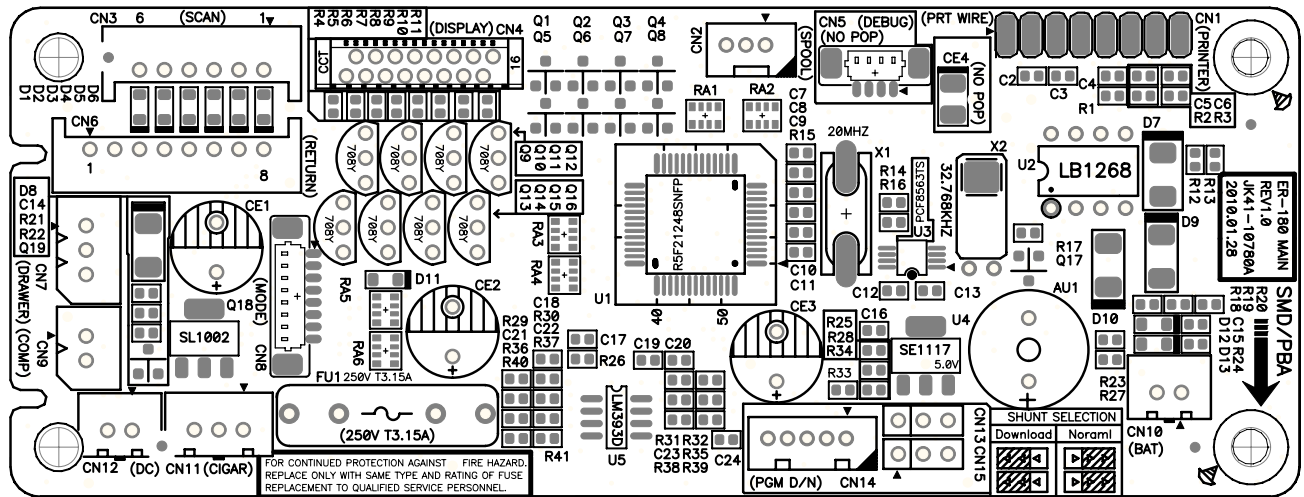
D. ASS'Y-PRINTER

No	Part-No	Description / Specification	Q'TY	Design-Location	Serviceable	Remark
B	JK59-10120A	UNIT-PRINTER	1		Y	
101	JK81-10994A	AS-RUBBER FITTING (1065292)	1		Y	
102	JK81-10995A	AS-MOTOR (1243132)	1		Y	
103	JK81-10996A	AS-MOTOR GEAR (1064920)	1		Y	
105	JK81-10997A	AS-CUP SCREW (1283806)	1		Y	
106	JK81-10998A	AS-P/F DRIVE GEAR ASSY (1065255)	1		Y	
107	JK81-10999A	AS-DETECTOR ASSY (1065136)	1		Y	
108	JK81-11000A	AS-DETECTION WHEEL (1024276)	1		Y	
109	JK81-11001A	AS-PRINT WHEEL SHAFT (1017190)	1		Y	
110	JK81-11002A	AS-PRT WHEEL SPRING (1065054)	1		Y	
111	JK81-11003A	AS-RETAINING RING (1283658)	1		Y	
112	JK81-11004A	AS-PRINTER-WHEEL ASSY 1-6 (1072483)	1		Y	
120	JK81-11005A	AS-H/TRAN LEVER ASSY (1064810)	1		Y	
130	JK81-11006A	AS-CARRIAGE (1064716)	1		Y	
140	JK81-11007A	AS-HAMMER (1064797)	1		Y	
150	JK81-11008A	AS-HAMMER RET/SPRING (1064805)	1		Y	
160	JK81-11009A	AS-PRINT CAM (1064986)	1		Y	
118	JK81-11010A	AS-CARRIAGE SPRING (1064722)	1		Y	
119	JK81-11011A	AS-INK ROLL SPRING (1064649)	1		Y	
120	JK81-11012A	AS-SELE PAWL SPRING (1065317)	1		Y	
122	JK81-11013A	AS-P/F TRANS GEAR (1065284)	1		Y	
123	JK81-11014A	AS-P/F RATCHET WHEEL (1065284)	1		Y	
124	JK81-11015A	AS-PRT CHANGE OVER CAM (1065007)	1		Y	
125	JK81-11016A	AS-PLANET GEAR (1065363)	1		Y	
126	JK81-11017A	AS-SEL DRIVE GEAR (1065307)	1		Y	
127	JK81-11018A	AS-REDUCTION GEAR (1065161)	1		Y	
128	JK81-11019A	AS-RETAINING RING (1283656)	1		Y	
129	JK81-11020A	AS-COIL S/GEAR ASSY (1041872)	1		Y	
130	JK81-11021A	AS-RETAINING RING (1283658)	1		Y	
131	JK81-11022A	AS-POSITIONING SHAFT (1064974)	1		Y	
132	JK81-11023A	AS-POSITIONING PLATE (1064978)	1		Y	
133	JK81-11024A	AS-SELECTING RATCHET (1065315)	1		Y	
134	JK81-11025A	AS-TRIGGER L/SPRING (1064780)	1		Y	
135	JK81-11026A	AS-RETURN LEVER (1065352)	1		Y	
137	JK81-11027A	AS-TRIGGER PLATE (1017206)	1		Y	
138	JK81-11028A	AS-TRIGGER PLATE SPR (1064783)	1		Y	
139	JK81-11029A	AS-RETURN LEVER SPR (1065353)	1		Y	
140	JK81-11030A	AS-TRIGGER LEVER (1064776)	1		Y	
141	JK81-11031A	AS-PRINT SHAFT (1017209)	1		Y	
142	JK81-11032A	AS-CARRIAGE F/GEAR (1065001)	1		Y	
143	JK81-11033A	AS-PLATEN ASSY (1024287)	1		Y	
144	JK81-11034A	AS-JUMPER WIRE (1018148)	1		Y	
151	JK81-11036A	AS-S/PAWL SPR HOLDER (1065326)	1		Y	
152	JK81-11037A	AS-CUP SCREW (1284804)	1		Y	

Note: () means the Printer Manufacture's Parts List (EPSON's Parts List)

6 PCB Layout and Parts List

6-1 MAIN PCB



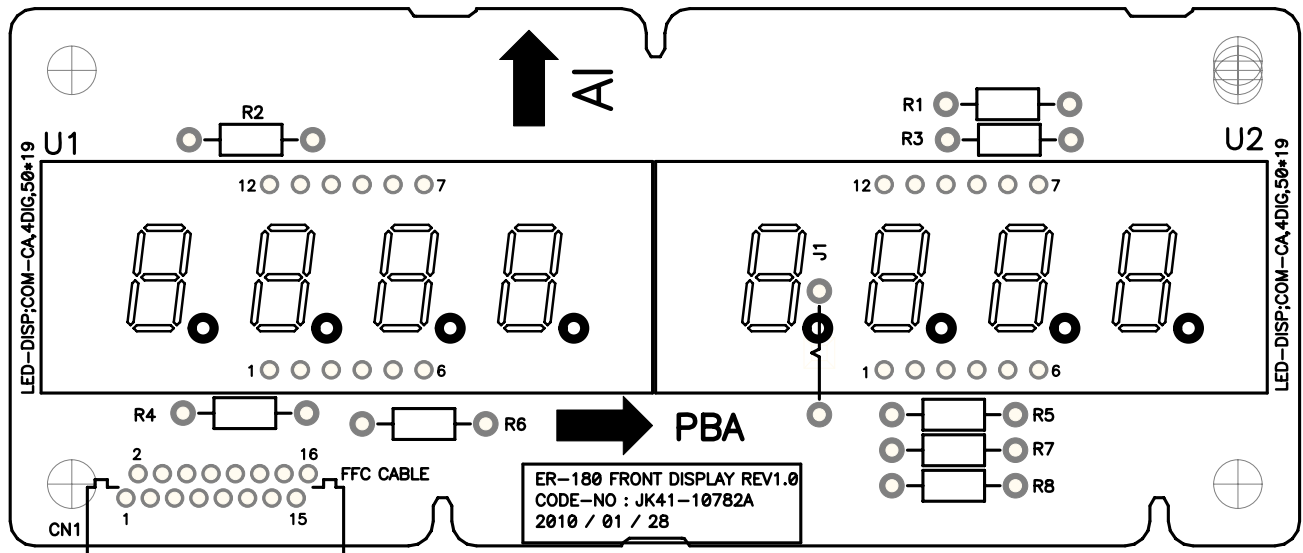
No	Part-No	Description / Specification	Q'TY	Design Location	Serviceable	Remarks
-	JK92-01645A	PBA MAIN-BOARD:ER-180,STD	1	ASSY	Y	
-	0501-000294	TR-SMALL SIGNAL:KSA708Y,PNP,800mW,TO-92	8	Q9-Q16	Y	
-	1209-001175	IC-ETC, LINEAR:-,-,-,PLASTIC,5V,LB1268	1	U2	Y	
-	2401-001363	C-AL:470uF,20%,16V,RADIAL,φ8x11.5L	3	CE1-CE3	Y	
-	2801-003376	CRYSTAL-UNIT:32.768KHz,20ppm,28-AAAY,12	1	X2	Y	
-	3002-001027	BUZZER-PIEZO:85dB,1.5V,24mA,2.048KHz,BK	1	AU1	Y	
-	3601-000261	FUSE-CARTRIDGE:250V,3.15A,TIME-LAG,GLASS	1	FU1	Y	
-	3602-000001	FUSE-CLIP:-,-,30mohm	2	FU1	Y	
-	3708-000306	CONNECTOR-FFC:6P,1R,2.54mm,ST,BLACK	1	CN3	Y	
-	3708-000327	CONNECTOR-FFC:8P,1R,2.54mm,ST,BLACK	1	CN6	Y	
-	3708-001418	CONNECTOR-FFC:16P,1mm,ST,DIP,TOP,IVORY	1	CN4	Y	
-	3711-003968	CONNECTOR-HEADER:BOX,3P,1R,2.5mm,ST	1	CN7	Y	
-	3711-003969	CONNECTOR-HEADER:BOX,2P,1R,2.5mm,ST	1	CN9	Y	
-	3710-000111	CONNECTOR-SHUNT:2P,1R,2.54mm,JMHA01,	2	CN13,CN15	Y	
-	3711-001475	CONN-HEADER:NOWALL,3P,1R,2.54mm,ST	2	CN13,CN15	Y	
-	3711-003409	CONNECTOR-HEADER:BOX,3P,1R,2mm,ST	1	CN2	Y	
-	3711-003420	CONNECTOR-HEADER:BOX,5P,1R,2mm,ST	1	CN14	Y	
-	3711-004100	WAFER;BOX-HEADER,1R,2P,2.5mm,ST,WHITE	2	CN10,CN12	Y	
-	3711-004104	WAFER;BOX-HEADER,1R,3P,2.5mm,ST,WHITE	1	CN11	Y	
-	0402-001189	DIODE-RECTIFIER:S1G-E3,M4,400V	3	D8,D9,D10	Y	

6. PCB Layout and Parts List

6-1 Main PCB

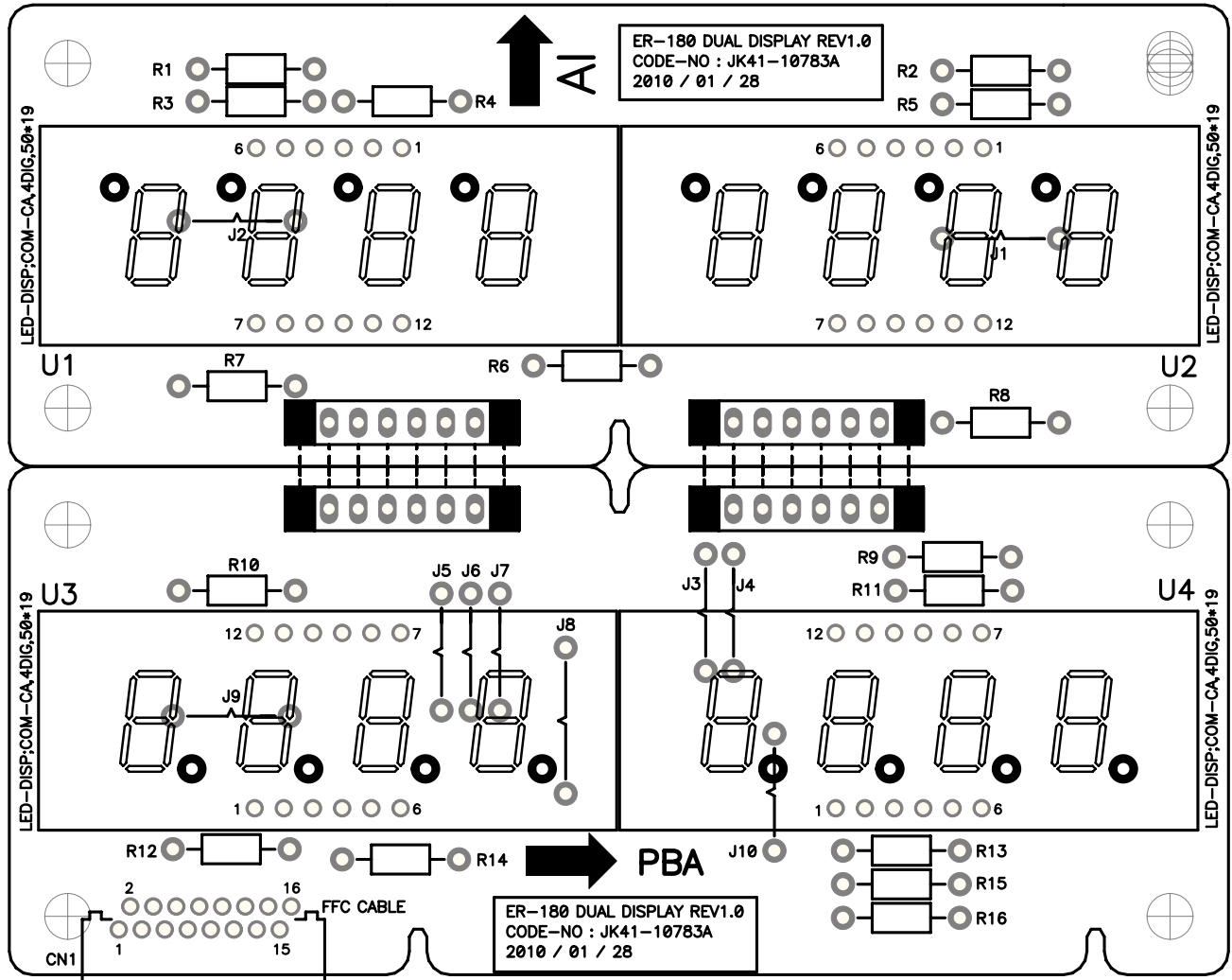
No	Part-No	Description / Specification	Q'TY	Design Location	Serviceable	Remarks
-	0404-001051	DIODE-SCHOTTKY:SK14,40V,1A,DO-214AA,	1	D7	Y	
-	0404-001052	DIODE-SCHOTTKY:BAT43WS,BAT54WS,30V	9	D1-D6,D11-D13	Y	
-	0501-000457	TR-SMALL SIGNAL:MMBT2222A,NPN,350MW,SOT	10	Q1-Q8,Q17,Q19	Y	
-	0502-000400	TR-POWER;SL1002,NPN,3A,10W,SOT-23	1	Q18	Y	
-	0904-001276	IC-CONTROLLER:R5F21248SNFP,LQFP,52P	1	U1	Y	
-	0909-000138	IC-REAL TIME CLOCK:PCF8563,I2C,TSSOP,8P	1	U3	Y	
-	1202-000164	IC-VOLTAGE COMPARATOR:KA393,SOP,8P,1.27	1	U5	Y	
-	1203-001774	IC-REGULATOR;SE1117-5.0V,SOT-223,4P	1	U4	Y	
-	2008-000001	R-CHIP:0 OHM,5%,1/10W,1608	1	R32	N	
-	2008-000002	R-CHIP:10 OHM,5%,1/10W,1608	1	R24	N	
-	2008-000012	R-CHIP:200 OHM,5%,1/10W,1608	3	R15,R23,R27	N	
-	2008-000026	R-CHIP:1KOHM,1%,1/10W,1608,1%	2	R25,R28	N	
-	2008-000030	R-CHIP:2KOHM,5%,1/10W,1608	4	R12,R13,R36,R40	N	
-	2008-000037	R-CHIP:4.7KOHM,1%,1/10W,1608,1%	6	R14,R16,R17,R22,R33,R34	N	
-	2008-000039	R-CHIP:5.6KOHM,5%,1/10W,1608	1	R38	N	
-	2008-000044	R-CHIP:10KOHM,1%,1/10W,1608,1%	15	R1-R11,R21,R26,R31,R35	N	
-	2008-000051	R-CHIP:27KOHM,5%,1/10W,1608	1	R41	N	
-	2008-000054	R-CHIP:36KOHM,1%,1/10W,1608,1%	1	R37	N	
-	2008-000055	R-CHIP:39KOHM,5%,1/10W,1608	1	R30	N	
-	2008-000063	R-CHIP:100KOHM,5%,1/10W,1608	3	R18,R29,R39	N	
-	2008-000074	R-CHIP:1MOHM,5%,1/10W,1608	2	R19,R20	N	
-	2011-001099	R-NETWORK;1KOHM,5%,1/16W,L,CH	1	RA3,RA4	Y	
-	2011-001100	R-NETWORK;4.7KOHM,5%,1/16W,L,CH	2	RA1,RA2	Y	
-	2011-001101	R-NETWORK;10KOHM,5%,1/16W,L,CH	1	RA5,RA6	Y	
-	2204-000003	C-CERAMIC,CHIP:15pF,5%,50V,1608	1	C13	N	
-	2204-000004	C-CERAMIC,CHIP:22pF,5%,50V,1608	2	C9,C10	N	
-	2204-000023	C-CERAMIC,CHIP:10nF,10%,50V,X7R,1608	3	C4,C5,C6	N	
-	2204-000028	C-CERAMIC,CHIP:100nF,+80-20%,25V,Y5V,1608	11	C2,C3,C7,C8,C12, C14-C16,C19-C21	N	
-	2204-000029	C-CERAMIC,CHIP:1uF,+80-20%,16V,Y5V,1608	4	C11,C17,C22,C24	N	
-	2801-003394	CRYSTAL-SMD:20MHz,SX-1,16pF,50ppm	1	X1	Y	
-	3711-004123	WAFER;BOX-HEADER,1R, 8P,1.25mm,SMD	1	CN8	Y	
-	JK41-10780A	PCB-MAIN:ER-180,FR-4,2L,T1.6	1	PCB	N	

6-2 FRONT DISPLAY PCB



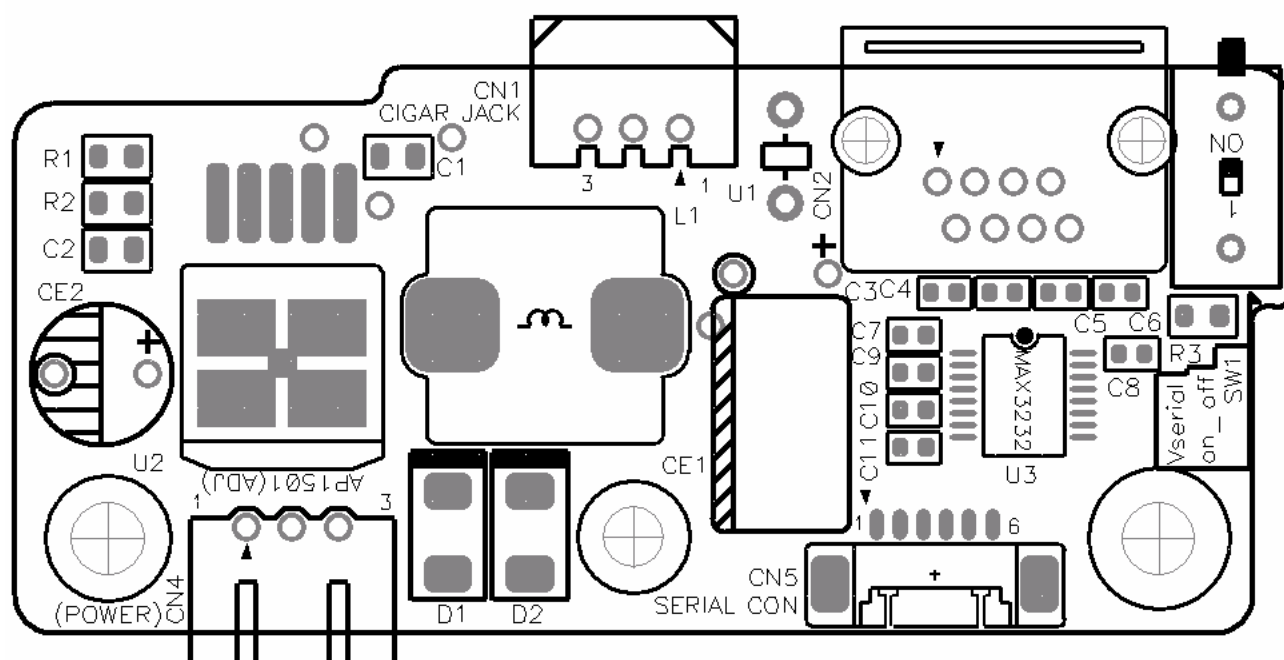
No	Part-No	Description / Specification	Q'TY	Design Location	Serviceable	Remarks
-	JK92-01648A	PBA-DISPLAY:ER-180,FRONT	1	ASSY	Y	
-	3708-001417	CONNECTOR-FFC:16P,1mm,AN,DIP,UPSIDE,IVR,	1	CN1	Y	
-	JK07-00018A	DISPLAY-FND:ER180,FND*4,12PIN,Y/G	2	U1,U2	Y	
	2001-000027	R-CARBON:100OHM,5%,1/4W,AA,TP,2.4X6.0MM	8	R1-R8	Y	
-	JC39-40511A	CBF HARNESS:ML-80,JUMPER,AWG22,52mm,SILV	1	J1	Y	
-	JK41-10782A	PCB-DISPLAY:ER-180,FRONT,FR-1,T1.6	1	PCB	N	

6-3 DUAL DISPLAY PCB



No	Part-No	Description / Specification	Q'TY	Design Location	Serviceable	Remarks
-	JK92-01647A	PBA-DISPLAY:ER-180,DUAL	1	ASSY	Y	
-	3708-001417	CONNECTOR-FFC:16P,1mm,AN,DIP,UPSIDE,IVR,	1	CN1	Y	
-	JK07-00018A	DISPLAY-FND:ER180,FND*4,12PIN,Y/G	4	U1-U4	Y	
-	JK39-40804A	HARNESS-JUMP WIRE:ER180,80mm,8P,DISPLAY	2	DISPLAY HAR.	Y	
-	2001-000027	R-CARBON:100OHM,5%,1/4W,AA,TP,2.4X6.0MM	16	R1-R16	Y	
-	JC39-40511A	CBF HARNESS:ML-80,JUMPER,AWG22,52mm,SILV	10	J1-J10	Y	
-	JK41-10783A	PCB-DISPLAY:ER-180,DUAL,FR-1,T1.6	1	PCB	N	

6-4 CIGAR-JACK PCB

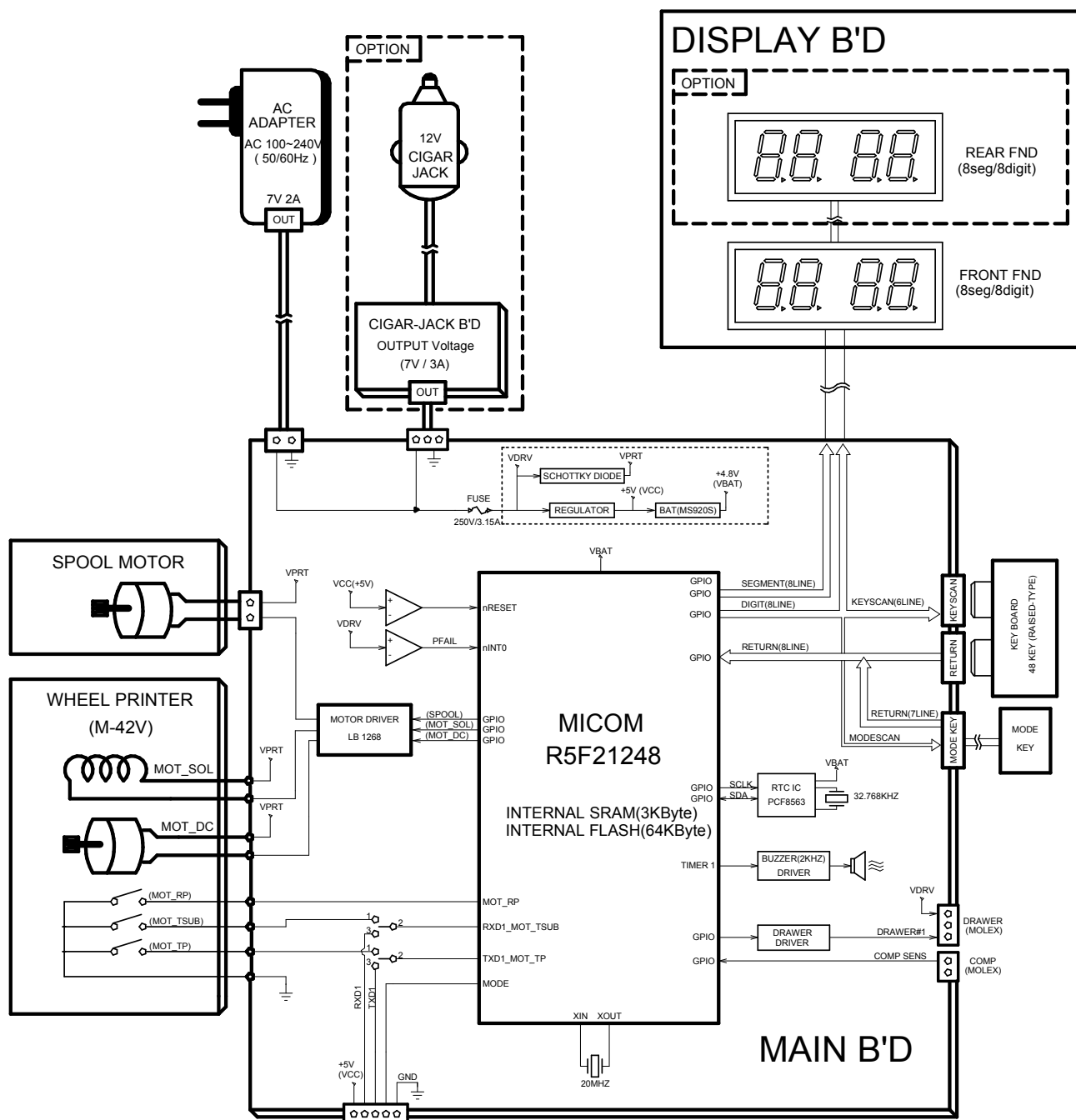


No	Part-No	Description / Specification	Q'TY	Design Location	Serviceable	Remarks
-	JK92-01649A	PBA-CIGARJACK:ER-180,OPTION	1	ASSY	Y	
-	2401-000032	C-AL:100uF,50V,RADIAL,φ8*11.5L,RoHS	1	CE1	Y	
-	2401-000042	C-AL:100uF,16V,RADIAL,φ6.3*7L,RoHS	1	CE2	Y	
-	3603-000004	POLY-SW;RUEF160,30V,1.6A,DIP,RADIAL	1	U1	Y	
-	3711-000823	CONNECTOR-HEADER:BOX,3P,1R,2.5mm,ANGLE	1	CN1	Y	
-	3711-004099	WAFER;BOX-HEADER,1R,3P,2.5mm,AN,WHITE,	1	CN4	Y	
-	JK39-40805A	HARNESS-CIGA JACK:ER180,3P,140mm	1		Y	
-	0404-001051	DIODE-SCHOTTKY:SK14,40V,1A,DO-214AA,	2	D1,D2	Y	
-	1203-001776	IC-REGULATOR:AP1501-K5L,TO263-5L,SMD,ADJ	1	U2	Y	
-	2007-000297	R-CHIP:10KOHM,1%,1/8W,DA,TP,2012	1	R2	N	
-	2007-000671	R-CHIP:2KOHM,5%,1/8W,DA,TP,2012	1	R1	N	
-	2203-000192	C-CERAMIC,CHIP:100nF,+80-20%,50V,Y5V,TP,	1	C1,C2	Y	
-	JK27-60102A	L-COIL:BDS-1055R,33uH,SMD,IND-330M-SM-12	1	L1	Y	
-	JK41-10784A	PCB-CIGAR JACK:ER-180,FR-4,2L,T1.6	1	PCB	N	

Memo

7 Block Diagram

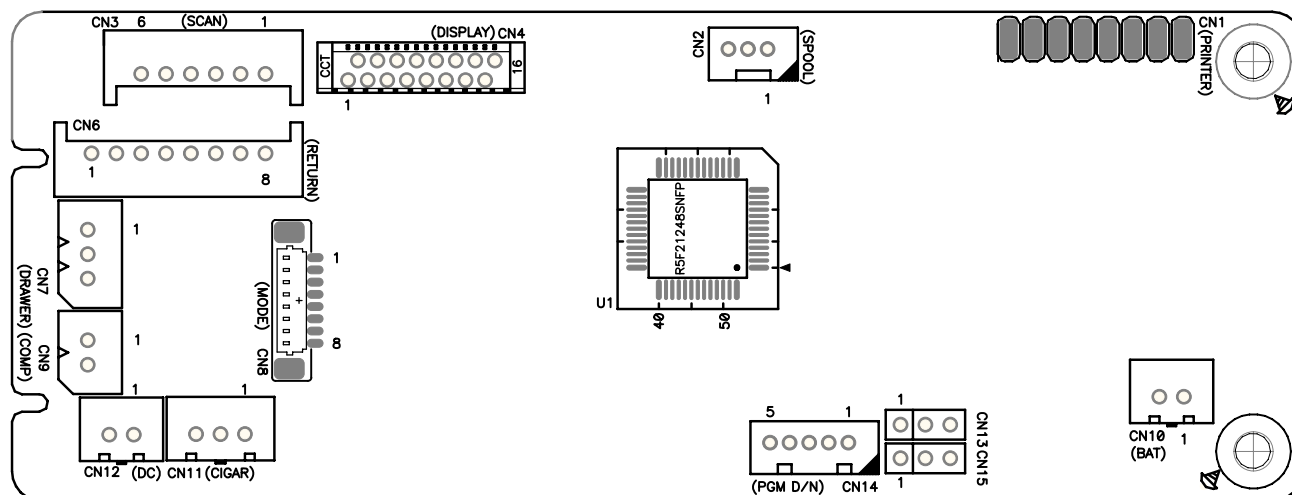
7-1 Block Diagram



Memo

8 Wiring Diagram

8-1 Main PCB



CN1 (PRINTER)

Pin No	Signal Name	Pin No	Signal Name	Pin No	Signal Name
1	MOT_SOLE_OUT	4	MOT_DC_OUT	7	GND
2	VPRT	5	PRT_TP	8	PRT_TSUB
3	VPRT	6	PRT_RP		

CN2 (SPOOL)

Pin No	Signal Name	Pin No	Signal Name	Pin No	Signal Name
1	VPRT	2	N.C	3	MOT_SPOOL_OUT

CN3 (KEY SCAN)

Pin No	Signal Name	Pin No	Signal Name	Pin No	Signal Name
1	KEYSCAN_1	3	KEYSCAN_3	5	KEYSCAN_5
2	KEYSCAN_2	4	KEYSCAN_4	6	KEYSCAN_6

CN6 (KEY RETURN)

Pin No	Signal Name	Pin No	Signal Name	Pin No	Signal Name
1	RETURN_KEY1	4	RETURN_KEY4	7	RETURN_KEY7
2	RETURN_KEY2	5	RETURN_KEY5	8	RETURN_KEY8
3	RETURN_KEY3	6	RETURN_KEY6		

8. Wiring Diagram

CN4 (DISPLAY)

Pin No	Signal Name	Pin No	Signal Name	Pin No	Signal Name
1	VFD_GRD#8_OUT	7	VFD_GRD#6_OUT	13	VFD_GRD#2_OUT
2	VFD_SEG#8(DP)_IN	8	VFD_SEG#6(F)_IN	14	VFD_SEG#7(G)_IN
3	VFD_GRD#4_OUT	9	VFD_GRD#5_OUT	15	VFD_GRD#3_OUT
4	VFD_SEG#4(D)_IN	10	VFD_SEG#2(B)_IN	16	VFD_SEG#1(A)_IN
5	VFD_GRD#7_OUT	11	VFD_GRD#1_OUT		
6	VFD_SEG#5(E)_IN	12	VFD_SEG#3(C)_IN		

CN7 (DRAWER)

Pin No	Signal Name	Pin No	Signal Name	Pin No	Signal Name
1	VDRV	5	NC	9	DRAWER_OUT

CN8 (MODE KEY)

Pin No	Signal Name	Pin No	Signal Name	Pin No	Signal Name
1	MODE_KEY_SCAN#7	4	RETURN_5	7	RETURN_2
2	RETURN_7	5	RETURN_4	8	RETURN_1
3	RETURN_6	6	RETURN_3		

CN9 (COMPULSORY)

Pin No	Signal Name	Pin No	Signal Name
1	Vcc	2	SOMPULSORY_OUT

CN10 (EXTERANL BATTERY)

Pin No	Signal Name	Pin No	Signal Name
1	BAT +	2	BAT -

CN11 (CIGAR-POWER)

Pin No	Signal Name	Pin No	Signal Name	Pin No	Signal Name
1	GND	2	NC	3	VDRV

CN12 (DC-JACK)

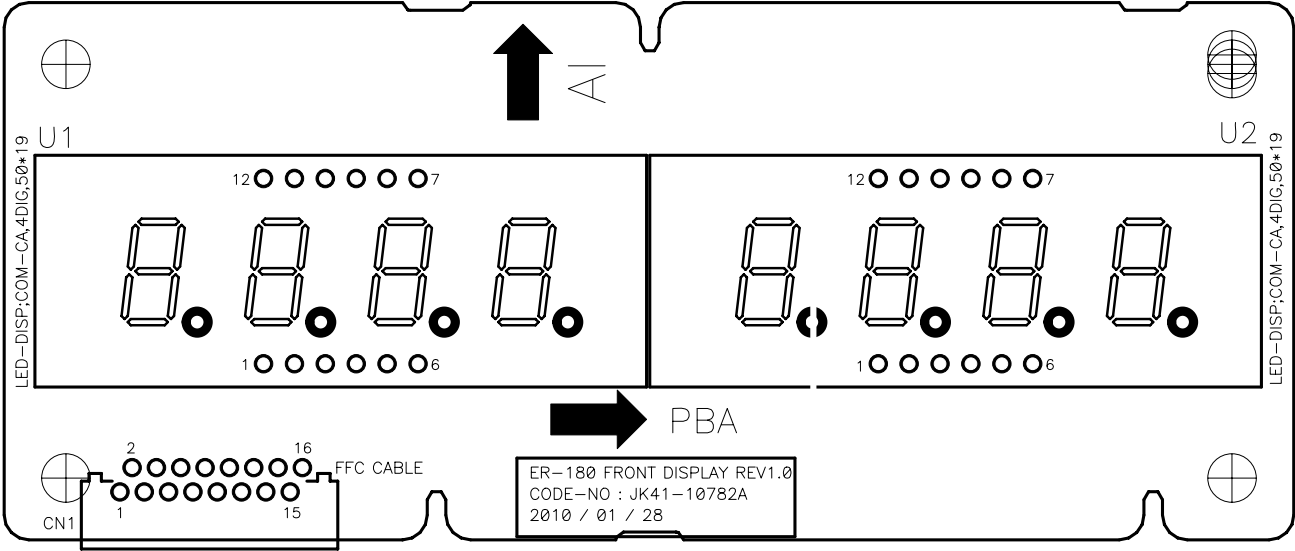
Pin No	Signal Name	Pin No	Signal Name
1	GND	2	VDRV

CN11 (PROGRAM DOWNLOAD)

Pin No	Signal Name	Pin No	Signal Name	Pin No	Signal Name
1	Vcc	3	TXD1	5	GND
2	RXD1	4	MODE		

8. Wiring Diagram

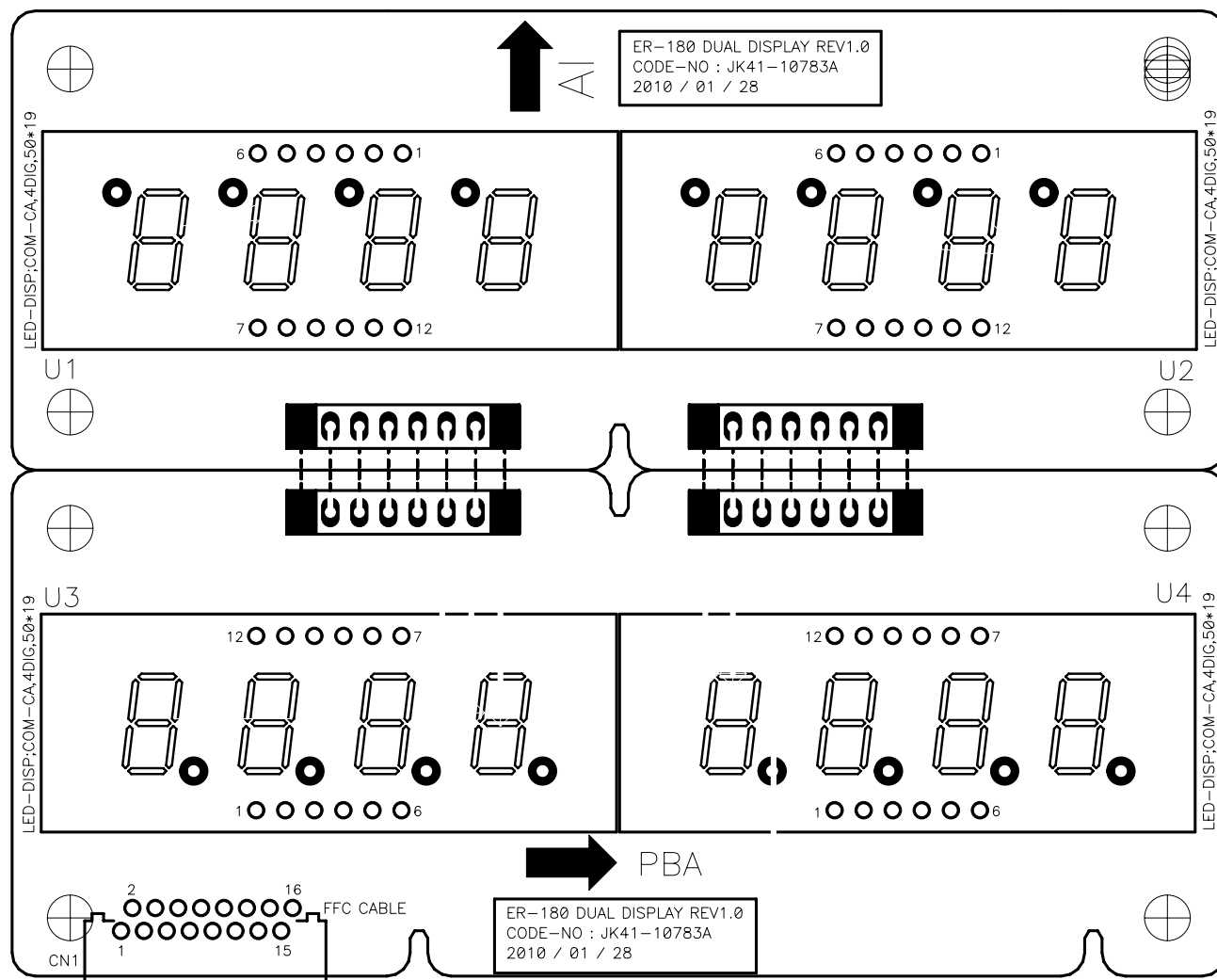
8-2 FRONT DISPLAY PCB



CN1 (DISPLAY)

Pin No	Signal Name	Pin No	Signal Name	Pin No	Signal Name
1	VFD_SEG#1(A)	7	VFD_SEG#2(B)	13	VFD_SEG#4(D)
2	VFD_GRD#3	8	VFD_GRD#5	14	VFD_GRD#4
3	VFD_SEG#7(G)	9	VFD_SEG#6(F)	15	VFD_SEG#8(DP)
4	VFD_GRD#2	10	VFD_GRD#6	16	VFD_GRD#8
5	VFD_SEG#3(C)	11	VFD_SEG#5(E)		
6	VFD_GRD#1	12	VFD_GRD#7		

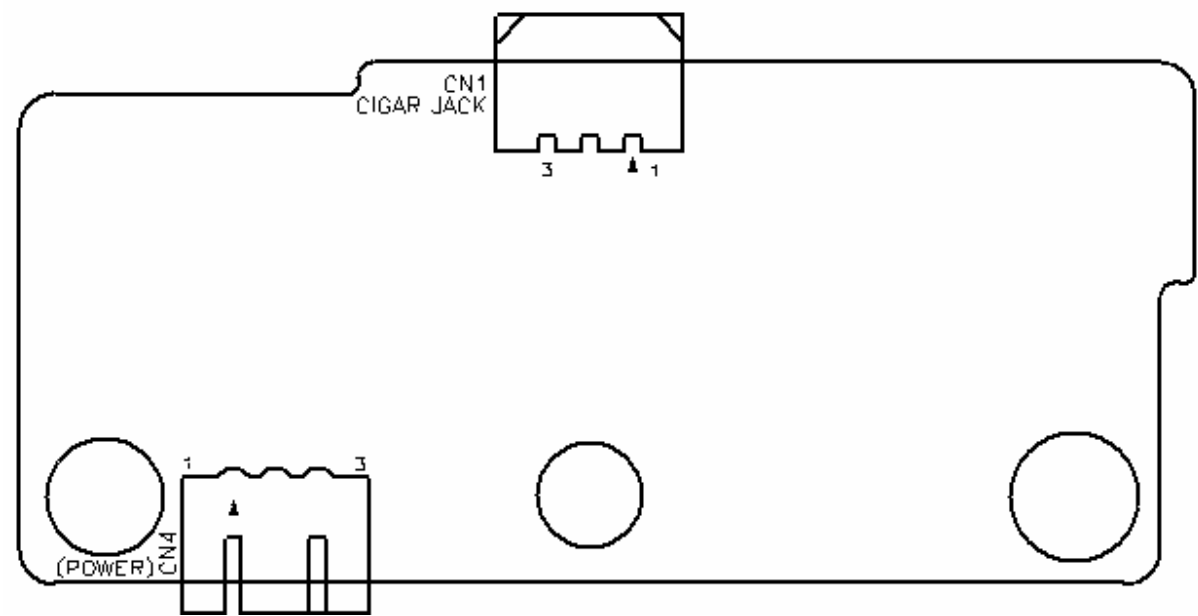
8-3 DUAL DISPLAY PCB



CN1 (DISPLAY)

Pin No	Signal Name	Pin No	Signal Name	Pin No	Signal Name
1	VFD_SEG#1(A)	7	VFD_SEG#2(B)	13	VFD_SEG#4(D)
2	VFD_GRD#3	8	VFD_GRD#5	14	VFD_GRD#4
3	VFD_SEG#7(G)	9	VFD_SEG#6(F)	15	VFD_SEG#8(DP)
4	VFD_GRD#2	10	VFD_GRD#6	16	VFD_GRD#8
5	VFD_SEG#3(C)	11	VFD_SEG#5(E)		
6	VFD_GRD#1	12	VFD_GRD#7		

8-4 CIGAR-JACK PCB



CN1 (CIGAR-JACK)

Pin No	Signal Name	Pin No	Signal Name	Pin No	Signal Name
1	12V(CIGAR)	2	GND	3	GND

CN4 (CIGAR-JACK)

Pin No	Signal Name	Pin No	Signal Name	Pin No	Signal Name
1	VDRV(7.5V)	2	GND	3	GND

9 Schematic Diagram

[Schematics Sheet Content]

1. MAIN PCB Schematics.

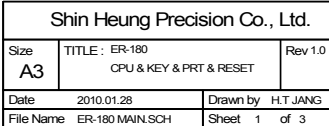
- | | |
|--|----------|
| 1) CPU / PRT / KEY / _RESET Part | Page 9-2 |
| 2) DWR / RTC / P_FAIL / BAT / PGM Part | Page 9-3 |
| 3) DISPLAY Part | Page 9-4 |

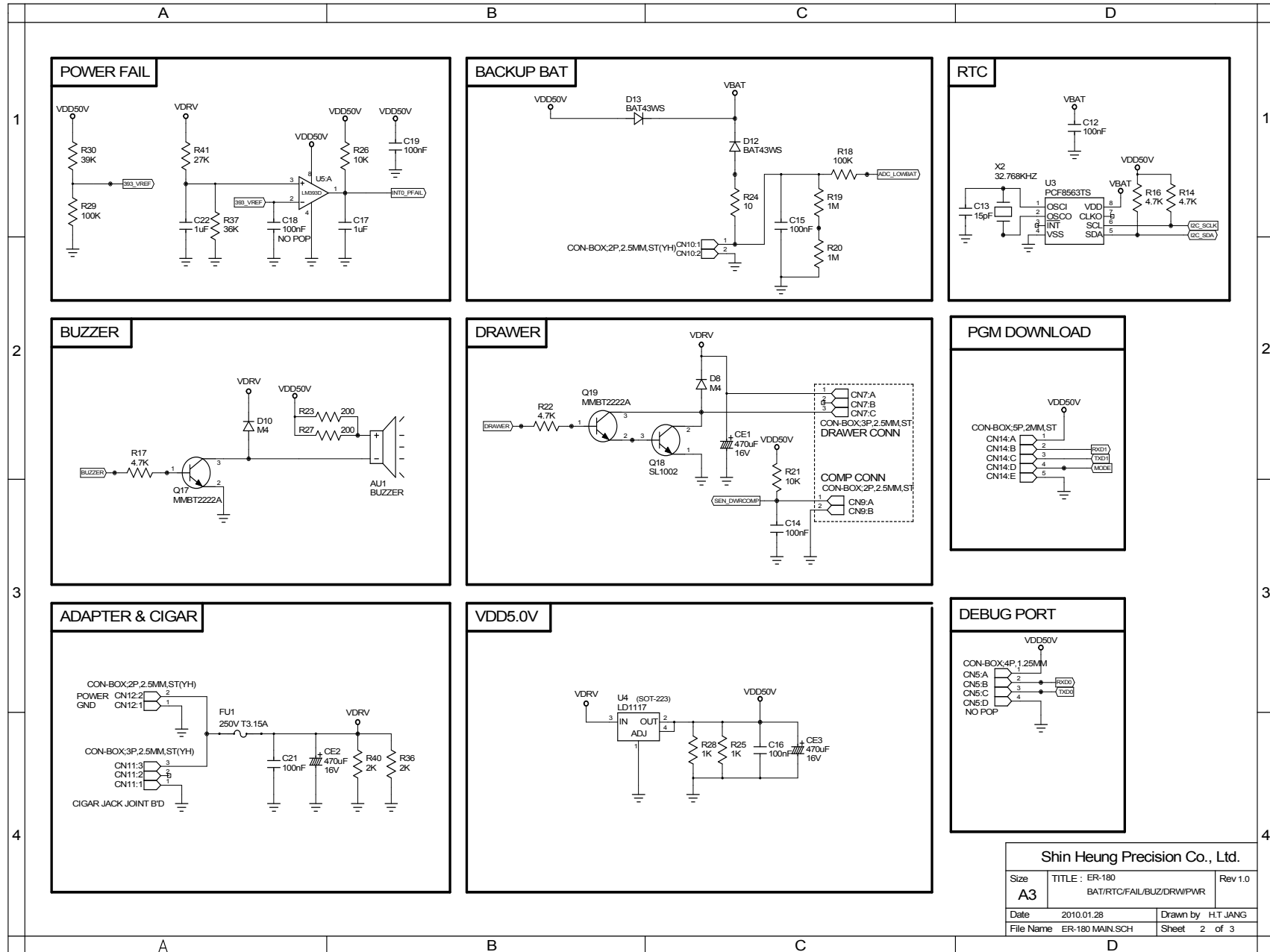
2. FRONT DISPLAY PCB Schematics.

- | | |
|-----------------------|----------|
| 1) FRONT DISPLAY Part | Page 9-5 |
|-----------------------|----------|

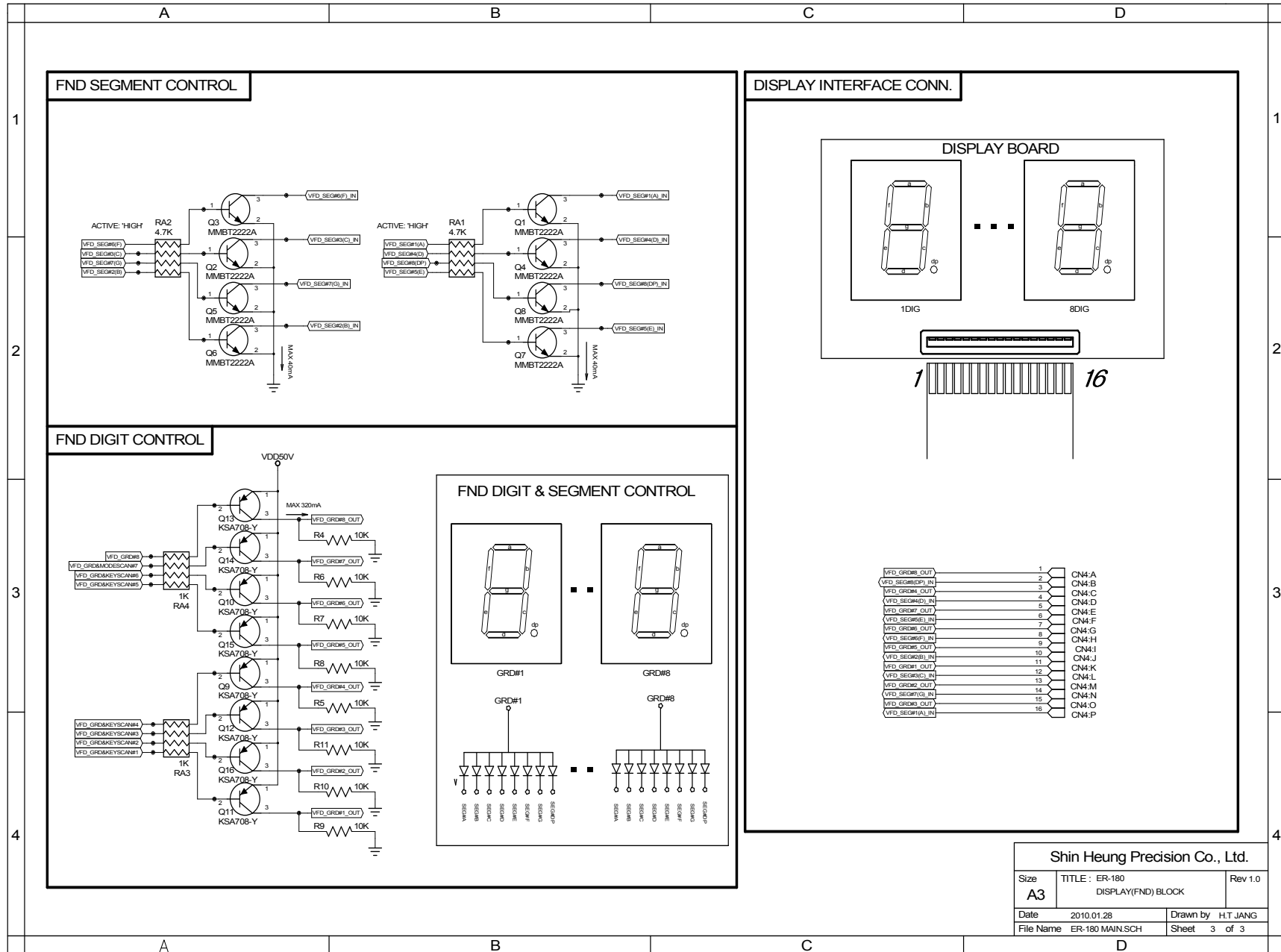
3. DUAL DISPLAY PCB Schematics.

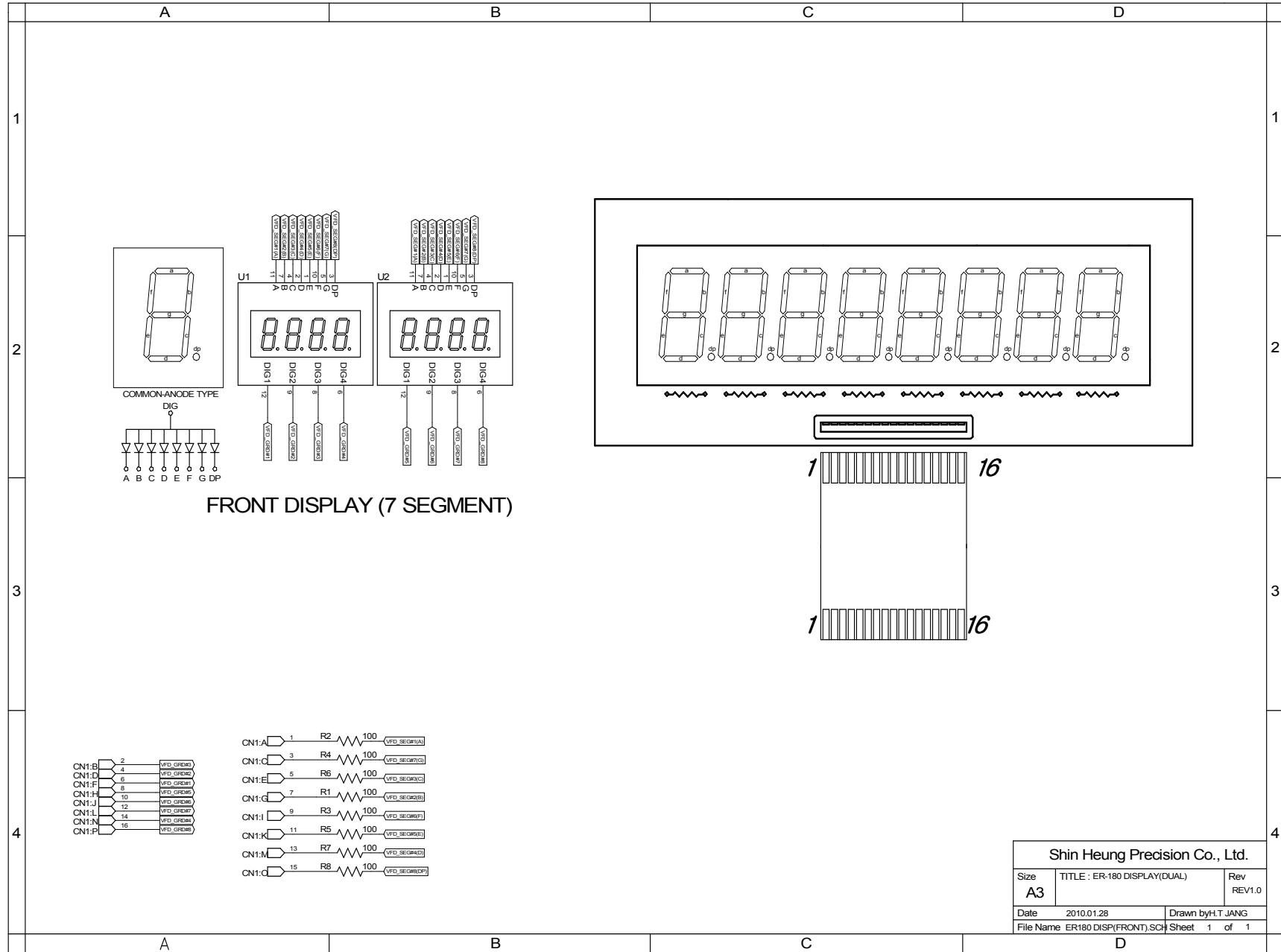
- | | |
|----------------------|----------|
| 2) DUAL DISPLAY Part | Page 9-6 |
|----------------------|----------|



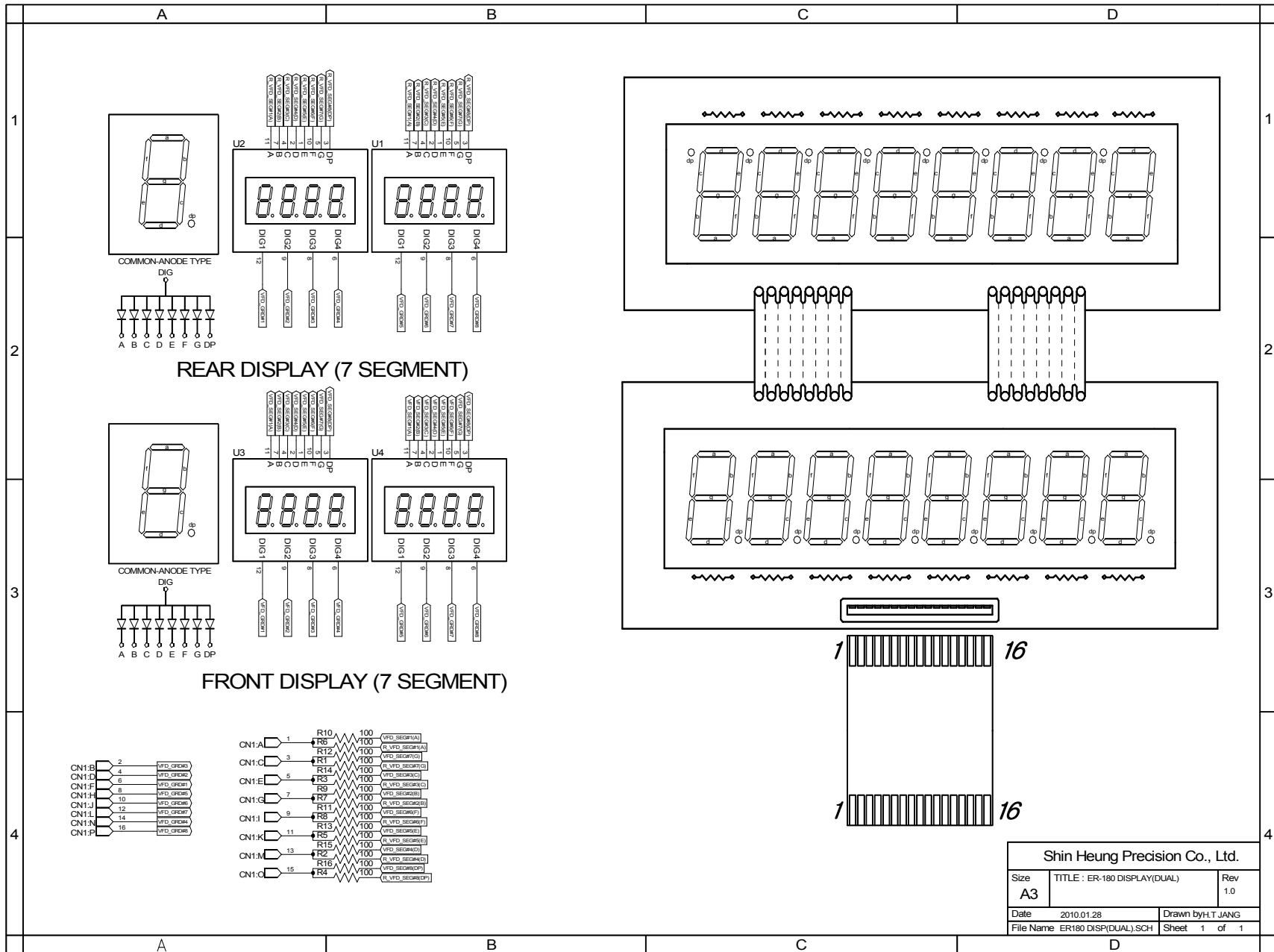


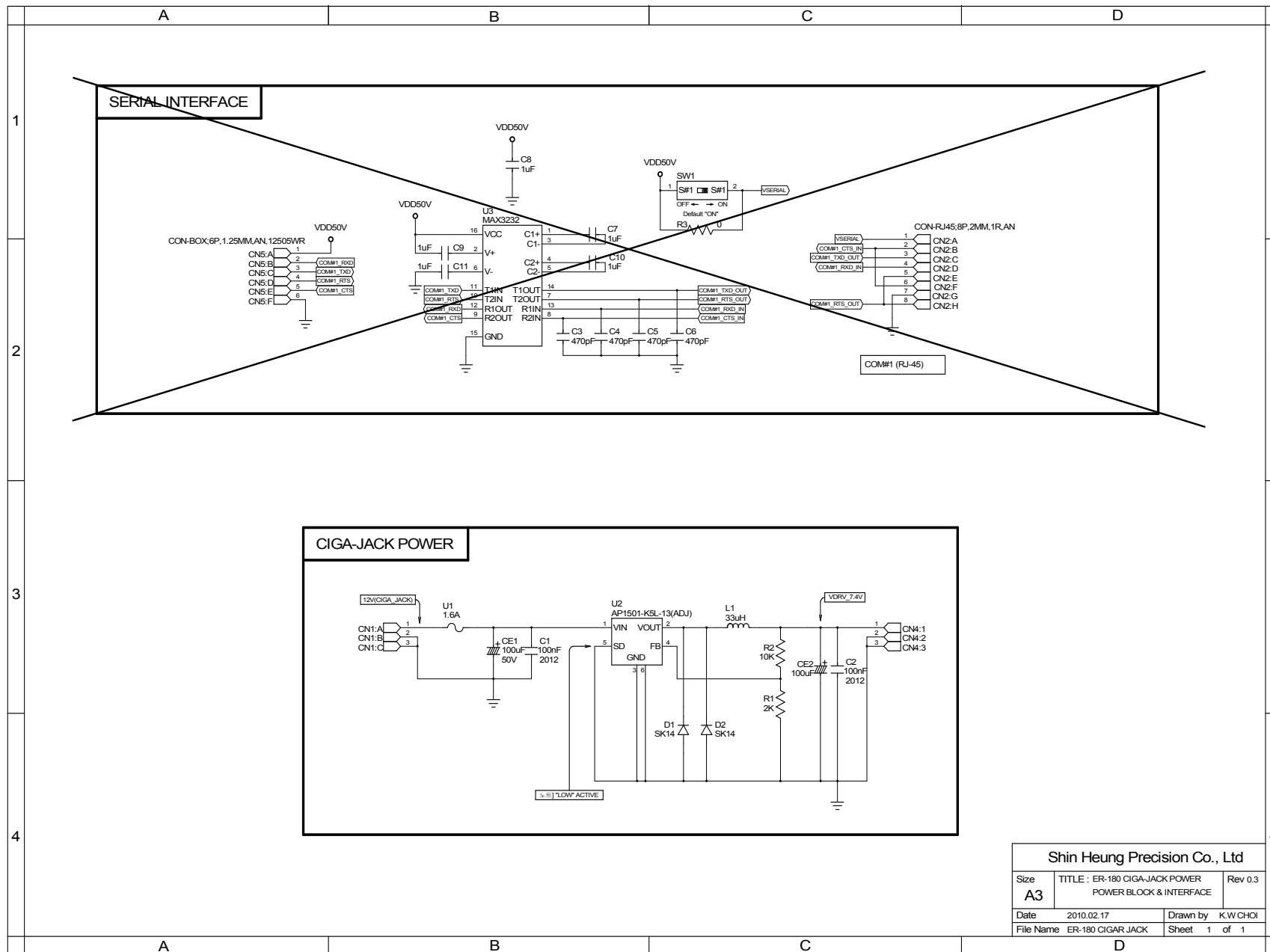
Shin Heung Precision Co., Ltd.		
Size	TITLE : ER-180	Rev 1.0
A3	BAT/RTC/FAIL/BUZ/DRW/PWR	
Date	2010.01.28	Drawn by H.T.JANG
File Name	ER-180 MAIN.SCH	Sheet 2 of 3





Shin Heung Precision Co., Ltd.		
Size A3	TITLE : ER-180 DISPLAY(DUAL)	Rev REV1.0
Date 2010.01.28	Drawn by: I.T JANG	
File Name ER180 DISP(FRONT).SCH	Sheet 1	of 1





Shin Heung Precision Co., Ltd		
Size A3	TITLE : ER-180 CIGA-JACK POWER POWER BLOCK & INTERFACE	Rev 0.3
Date 2010.02.17	Drawn by K.W. CHOI	
File Name ER-180 CIGAR JACK	Sheet 1 of 1	

UPDATE LOG

[illegible]

Use this page to record any special servicing information such as Service Bulletins or Supplements.
When possible, record changes to Code numbers directly on the actual Parts List.
Always records Service Bulletin numbers and Application Dates on this log to ensure that your data is always as current as possible.

SAM4S

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Printed in KOREA.
V1.0
Code No. : JK68-70129A